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A MANUAL

OF

ORCHIDACEOUS PLANTS

CULTIVATED UNDER GLASS IN GREAT BRITAIN.

PART IX.

CYMBIDIUM, ZYGOPETALUM, LYCASTE,

ACINETA, ANGULOA, BIFRENARIA, COCHLIODA,
COMPARETTIA, CYCNOCHES, GRAMMATOPHYLLUM, GALEANDRA,
MAXILLARIA, MORMODES, RODRIGUEZIA, STANHOPEA,
TRICHOPILIA, Etc., Etc.

JAMES VEITCH & SONS,
Royal Exotic Nursery, 544, King's Road, Chelsea, S.W.
1893.

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PRELIMINARY NOTICE.

This Manual is being compiled to supply amateurs and cultivators of exotic Orchids with a fuller account of the principal genera, species and varieties cultivated under glass, than is contained in the Manuals hitherto in use.

The rapid extension of Orchid culture during the last quarter of a century, resulting from the increased taste for and appreciation of this beautiful and interesting order of plants, has, in our opinion, created the *desideratum* which we are now attempting to supply. The prominent place, too, occupied by Orchids in the columns of the Horticultural Press, and the surprising amount of practical and varied information respecting them disseminated through its agency, has also stimulated the desire to obtain all the leading facts in a condensed form, to which easy reference may at any time be made.

So numerous are the species and varieties of Orchids at present in cultivation, and to which additions are constantly being made by new discoveries and by artificial hybridisation, that the labour attending the compilation of a Manual sufficiently comprehensive to meet the wants of cultivators must necessarily demand much time. Moreover, the present unsatisfactory state of Orchidology, especially in its horticultural aspect and its complicated and unscientific nomenclature, have rendered the compilation of such a Manual within a stated time almost an impossibility.

Under these circumstances, and yielding to the solicitations of patrons and friends, we have decided upon issuing the work in parts, each part containing a monograph of the cultivated species and varieties of one of the most important genera, or of a group of genera.

Little explanation of the plan of the work is here needed; the parts as issued must speak for themselves. We have only to state that in the scientific classification and sequence of the genera we have followed, with but trifling deviations, the arrangement of Bentham and Hooker as elaborated in their *Genera Plantarum*, the most profound and, at the same time, the most intelligible exposition of the Orchideæ extant. In the nomenclature of the species, we have adhered to the Laws of Botanical nomenclature adopted by the International Botanical Congress, held at Paris in August, 1867.

In the description of the species, we have been compelled to use occasionally a few technical terms to avoid cumbrous circumlocutions; at the conclusion of the work we propose giving a glossary of the terms so used. In the cultural notes we have quoted temperatures in the Centigrade scale with the equivalent Fahrenheit readings, in the hope that the far more rational scale, now almost universally adopted in scientific investigations, may also come into use in horticulture. The literary references in italics indicate coloured plates of the species or variety described.

A MANUAL OF ORCHIDACEOUS PLANTS.

VOL. II.

A MANUAL

OF

ORCHIDACEOUS PLANTS

CULTIVATED UNDER GLASS IN GREAT BRITAIN.

VOL. II.

VANDEÆ–CYPRIPEDIEÆ.

JAMES VEITCH & SONS,
Royal Exotic Nursery, 544, King's Road, Chelsea, S.W.

1887—94.

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Jan. 9, 1911
Gray Herbarium
Harvard University

H. M. POLLETT & Co.,
HORTICULTURAL AND GENERAL PRINTERS,
FANN STREET, ALDERSGATE STREET,
LONDON, E.C.

TRIBE—VANDEÆ.

SUB-TRIBE EULOPHIEÆ.

Terrestrial herbs, rarely epiphyte, with leafy stems often thickened into pseudo-bulbs. Leaves few, plicately-veined, often narrow. Racemes simple, rarely branched.*

EULOPHIA.

R. Br. in Bot. Reg. t. 686 (1822). Benth. et. Hook. Gen. Plant. III. p. 535 (1883).

Eulophia includes more than fifty species dispersed over tropical Africa and the Indo-Malayan region, but very few of them have been introduced into European orchid collections, and these are cultivated chiefly in botanic gardens. The genus is noticed here solely for the purpose of inserting the type species which is a very handsome one, and, in a horticultural sense, the best Eulophia yet seen in cultivation.

Eulophia guineensis.

Pseudo-bulbs clustered, sub-globose, approaching ovoid, 1½—2 inches in diameter, monophyllous. Leaves elliptic-oblong or linear-oblong, sub-acuminate, 7—10 inches long, narrowed below into a slender petiole, one-third to one-half as long as the blade. Scapes stoutish, pale green, 24—36 inches long, racemose along the distal half, many-flowered; cauline bracts sheathing, 2 inches long; floral bracts much smaller, linear, acuminate. Flowers 2 inches across vertically; sepals and petals similar and equal, and but slightly divergent from each other, linear, acuminate, twisted, greenish purple, sometimes rose-purple with paler margin; lip of peculiar shape and structure, three-lobed, the side lobes small, adnate to the column at their superior margin, and forming with it a funnel-shaped cavity that is prolonged into a slender spur as long as the pedicel and ovary; the front lobe large and spreading, sub-rhomboidal with crenulate margin, light rose-purple with darker veins, and with a dark purple stain at the base. Column short, much compressed, rounded and purple above, nearly flat and whitish below.

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* This sub-tribe includes but three genera, viz., Eulophia, from εὔλοφος, "handsomely crested," in reference to the crest of the type species; Lissochilus, from λισσὸς, "smooth," and χειλος, "a lip"; and Galeandra, a hybrid word from the Latin *galea*, "a helmet," but this perhaps from γαλέη, and ἀνὴρ ἀνδρος, "an anther," in reference to the helmet-like cap of the anther. It is, however, a very natural sub-division of the VANDEÆ.

Eulophia guineensis, R. Br. in *Bot. Reg.* t. 686 (1822). *Bot. Mag.* t. 2467. Lindl. Gen. et. Sp. Orch. p. 181. Williams' *Orch. Alb. II.* t. 89 (purpurata). *The Garden XIX.* (1881), t. 277.

Introduced in 1821 from Sierra Leone by George Don, collector for the Horticultural Society of London, in whose garden at Chiswick it flowered in the following year. It was also sent to Messrs. Loddiges in 1822 by George Hawkins, who collected it in Los, one of the small islands off the coast of Sierra Leone. For materials for description we are indebted to Sir Trevor Lawrence, Bart., in whose collection at Burford Lodge this orchid has long been successfully cultivated, flowering usually in August and September.

Cultural Note.—The following details of the cultural treatment of *Eulophia guineensis* at Burford Lodge was communicated to *The Garden* by the late Mr. Spyers:—"The plant is potted in a mixture of peat and sphagnum, but sometimes fibrous peat, charcoal and broken crocks are used, the pots being half full of drainage. During the growing season the plant is kept in a shady position in the East Indian house with liberal supplies of water. When in flower it is moved to a more airy position in the intermediate house. Being deciduous it does not require a large amount of water from the time when its foliage changes colour till the growing season commences again."*

LISSOCHILUS.

R. Br. in Bot. Reg. t. 573 (1821). Lindl. Collect. Bot. t. 31. Benth. et. Hook. Gen. Plant. III. p. 536 (1883).

This genus is very closely allied to Eulophia, differing chiefly in the petals being much larger and usually more brightly coloured than the sepals; but as this character, as Mr. Bentham remarks, is observed in some of the Asiatic species of Eulophia † the two genera may hereafter be merged into one.

Lissochilus is a purely African genus, including about thirty species, but of these very few are cultivated in European gardens, those described in the following pages being among the most noteworthy.

Cultural Note.—Being natives of one of the hottest regions of the world *Lissochilus giganteus* and *L. Horsfallii* require the highest temperature available in the orchid houses of Europe. *L. Krebsii* is a sub-tropical species for which an intermediate temperature is suitable. They should all be potted in fibrous loam, and treated generally as recommended for *Eulophia guineensis* (*see* supra).

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* The Garden, vol. XIX. (1881), p. 332.

† Journ. Linn. Soc. XVIII. p. 317.

Lissochilus giganteus.

A robust stately plant. Leaves narrowly lanceolate, acute, 3—5 feet long. Scapes erect, 6—8 or more feet high, racemed above the middle, many-flowered; bracts large, broadly oval-oblong, apiculate, shorter than the stalked ovaries. Flowers 2½—3 inches across the petals; sepals turned sharply back, spathulate, concave at the apex, greenish with a faint tinge of rose; petals large, erect, broadly obovate-oblong, obtuse, light rose-purple; lip three-lobed, produced at the base into a broad funnel-shaped spur, light rose-purple with some darker streaks on the front lobe, the side lobes rounded, erect, the intermediate lobe semi-orbicular, obtuse, with three yellow keels extending to the base of the funnel. Column semi-terete, bent, white.

Lissochilus giganteus, Welwitsch ex Rchb. in Flora, XLVIII. (1865), p. 187, and in Gard. Chron. III. s. 3 (1888), p. 616, with fig. Williams' *Orch. Alb. X.* t. 457.

This is an orchid of gigantic stature and an extraordinary plant in many respects, affording another illustration of the old adage, "Semper aliquid novi ex Africâ provenit." It was originally discovered by Dr. Welwitsch some time prior to 1862 in Angola, in Portuguese Africa, where it is widely dispersed, and also along the valley of the Congo. Dr. Welwitsch informed the late Professor Reichenbach that the plant is occasionally submerged and afterwards roasted in a soil as hard as brick.*

We copy from the *Gardeners' Chronicle* the following extract from Johnston's "Congo" relating to this remarkable orchid:—

> "The hot sun and the oozy mud call into existence a plant life which must parallel in rank luxuriance and monstrous growth the forests of the coal measures, and reproduce for our eyes in these degenerate days somewhat of the majesty of the vegetable kingdom in bygone epochs. In the marshy spots near the river shore are masses of that splendid orchid *Lissochilus giganteus*, a terrestrial species that shoots up often to the height of 16 feet from the ground, bearing such a head of red-mauve scented blossoms as scarcely any flower in the world can equal for beauty and delicacy of form. These orchids with their light green spear-like leaves and their tall swaying flower stalks, grow in groups of forty and fifty together, often reflected in

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* Gard. Chron. loc. cit. supra. Conditions that would appear to render its cultivation in the glass-houses of Europe an impossibility; nevertheless the plant at Burford Lodge lives and thrives.

> the shallow pools of stagnant water round their bases, and filling up the foreground of the high purple-green forest with a blaze of tender peach-like colour."

The merit of introducing it into European gardens is due to M. Auguste Linden, who brought it from the Congo in 1887. Its first flowering in this country at Burford Lodge, in May, 1888, and subsequent appearance at a meeting of the Royal Horticultural Society, was an event of unusual interest. We are indebted to Sir Trevor Lawrence, Bart., for materials for description.

L. Horsfallii.

> "Leaves lanceolate, narrowed below into a channelled petiole, 2—3 feet long. Scapes as long again as the leaves, terminating in a somewhat dense, many-flowered raceme; bracts sheathing, ovate-acute; sepals lanceolate, acuminate, an inch long, bent backwards, purplish brown; petals spreading, sub-quadrate, obtuse, white suffused with rose; lip funnel-shaped at the base, three-lobed, the lateral lobes large, erect, rounded, green streaked with crimson-purple, the intermediate lobe ovate, obtuse, of a deep puce colour, with three whitish elevated ridges on the disk which extend to the base. Column short, semi-terete, two-toothed at the apex."—*Botanical Magazine.*

Lissochilus Horsfallii, Batem. in *Bot. Mag.* t. 5486 (1865).

A stately species sent from Old Calabar to Mr. Horsfall, of Bellamour Hall, Staffordshire, in whose collection it flowered in October, 1864. It is now probably lost to cultivation, but the mention of it in this place may help to preserve it from oblivion.

L. Krebsii.

> Pseudo-bulbs ovoid or elliptic-oblong, 1½—3 inches long, marked with concentric scars. Leaves about six to each pseudo-bulb, elliptic-lanceolate, acuminate, sheathing at the base, the longest 18—24 inches long. Scapes stoutish, erect, 4—5 feet high, terminating in a loose raceme of 20—30 or more flowers, the rachis continuing to lengthen and produce flowers after the lowermost have expanded; bracts lanceolate, acuminate, as long as the ovaries. Flowers 1¼ inch in diameter; sepals spathulate-oblong, apiculate, keeled behind, reflexed, reddish brown mottled with green; petals broadly oval, obtuse, bright buttercup-yellow; lip three-lobed, saccate between the lateral lobes which are roundish and ascending, red-brown on the inside, yellow externally; the intermediate lobe sub-orbicular, emarginate, folded in the middle, bright yellow with two purple lateral blotches; spur short, obtuse. Column semi-terete, cream-white.

Lissochilus Krebsii, Rchb. in Linnæa, XX. p. 685 (1847). *Bot. Mag.* t. 5861.

var.—purpuratus.

Pseudo-bulbs and flowers larger than in the original form, the sepals deep purplish brown, the petals and middle lobe of lip bright canary-yellow, the side lobes chocolate-purple streaked with darker lines.

L. Krebsii purpuratus, H. N. Ridley in Gard. Chron. XXIV. (1885), p. 102. Williams' *Orch. Alb. VI.* t. 259.

Originally described by Reichenbach from specimens sent to Europe by the collector whose name it bears. It was introduced to the Royal Gardens at Kew, in 1867, by Mr. Sanderson, who sent living plants, along with other species, from Natal.* The variety, which is superior to the original form as a horticultural plant, was introduced from Natal in 1885 by Mr. E. A. Heath, F.L.S., who kindly sent us flowers for description.

GALEANDRA.

Lindl. Illus. Orch. Pl. t. 8 (1830-38). Id. Gen. et Sp. Orch. p. 186 (1832). Benth. et Hook. Gen. Plant. III. p. 536 (1883).

The Galeandras may, in a restricted sense, be regarded as the representatives in the western Continent of the Eulophias of Asia and Africa, for the number of species is scarcely a sixth of that of Eulophia, and although spread over a considerable area it is a limited one compared with the range of the Eulophias. The Galeandras occur sparingly in tropical America, from Mexico southwards, none, so far as we know, having been reported south of the Amazon. The broad funnel-shaped spur of the labellum and the almost sessile pollinia chiefly separate Galeandra from Eulophia.

Cultural Note.—The Galeandras require the same cultural treatment as that applied to Eulophia and Lissochilus, with unremitting attention throughout the year to watering, shading, freeing the plants from insect pests, etc.

Galeandra Batemanii.

Pseudo-bulbs variable, conic or ovoid, elongated, 4—6 inches long, marked with concentric scars and prolonged at the apex into a deciduous leafy stem. Leaves lanceolate, acute, 6—12 inches long. Racemes terminal, many-flowered. Flowers 2½ inches long; sepals and petals similar and sub-equal, bent backwards, spathulate-oblong, acute, variable in colour, buff-yellow, or green tinted with brown, tawny brown, etc.; lip large, sub-orbicular, with a deep cleft in the anterior margin, the basal half rolled over the column into a tube and prolonged below into a funnel-shaped spur, usually light yellow; the apical half open, rose-purple bordered with white. Column semi-terete, pale green.

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* Bot. Mag. sub. t. 5861.

Galeandra Batemanii, Rolfe in Gard. Chron. XII. s. 3 (1892), p. 481. G. Baueri, Lindl. in *Bot. Reg.* 1840, t. 49. Batem. *Orch. Mex. et Guat.* t. 19.* Paxt. *Mag. Bot. XIV.* p. 49. Rchb. in Walp. Ann. VI. p. 649. Williams' *Orch. Alb. VI.* t. 267.

Introduced from Mexico in 1838 by Mr. Barker, of Birmingham, through his collector Ross, who communicated the following particulars of its habitat:—

> He met with it at a place called Kisatipa, ten leagues from Melacatapec, growing at the upper end of a dry ravine, terminating half-way up the mountains in a south-west aspect. The temperature varies from 20°—25° C. (69°—77° F.) by day, and falls to about 15° C. (59° F.) by night. The mountains surrounding this ravine, that is, on the north-east side, are covered with a great variety of Orchideæ, whilst on the south side of the ravine there are none to be found. On the top of the mountains there is a continual mist all the year, December to February excepted; the atmosphere is particularly moist and warm.†

It was subsequently sent from southern Mexico to the Horticultural Society of London by Hartweg; it was also detected by Mr. G. Ure Skinner in Guatemala. The species is named in compliment to Mr. James Bateman, the veteran orchidologist, by whom it was first described and figured in his *Orchidaceæ of Mexico and Guatemala.*‡ The usual flowering season of *Galeandra Batemanii* is July—August.

> This plant has been in cultivation for more than half a century under the name of *Galeandra Baueri*, in the erroneous belief that it was the same species as the original *G. Baueri* described by Lindley in his *Illustrations of Orchidaceous Plants*. The error originated in Mr. Bateman having mistaken the Mexican plant discovered by Ross for the same species as that collected by Martin in French Guiana, a locality, as he himself observed, 1,000 miles away.

G. Baueri.

"Stems clustered, sub-cylindric or fusiform, 15—20 inches long. Leaves lanceolate, sharply acuminated, 7—9 inches long. Racemes terminal, drooping, many-flowered; bracts subulate, acute, longer than the pedicels. Flowers 1½—2 inches across vertically; sepals and petals similar and equal, lanceolate, acute, yellow, sometimes with a brownish hue; lip infundibuliform, obscurely three-lobed, the side lobes rolled over the column into a tube and produced into a long straight spur; the front lobe spreading, much undulated at the margin, mucronate at the apex; the tube deep yellow, the front lobe paler with red-purple lines. Column semi-terete, concealed within the tube."—*Botanical Magazine.*

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* The plate here quoted is confused by the introduction of parts of another plant belonging to a different species.

† Bot. Reg. 1840, sub. t. 49.

‡ *See* Mr. Rolfe's note in the *Gardeners' Chronicle*, loc. cit. supra.

Galeandra Baueri, Lindl. in Illus. Orch. Pl. Gen. t. 8 (1832—38). Id. Gen. et Sp. Orch. p. 187. *Bot. Mag.* t. 4701 (floribus luteis). G. cristata, Lindl. in Bot. Reg. 1844, misc. No. 69.

This is a very different species from that cultivated in gardens under the name of *Galeandra Baueri.* It was originally collected by Martin in French Guiana, and on his specimen which is still preserved in the Lindleyan herbarium now located at Kew, Dr. Lindley founded the genus, dedicating the type species to Francis Bauer, a skilful microscopic draughtsman who prepared the drawings in Lindley's *Illustrations* quoted above, and for many other botanical works published during the first half of the present century. It was first introduced into British gardens by Messrs. Loddiges in 1840, but did not flower till four years later; we next find it flowering in the gardens of Syon House in 1853, on which occasion it was figured in the *Botanical Magazine,* and subsequently in our own houses; since then it seems to have disappeared from cultivation.

G. Devoniana.

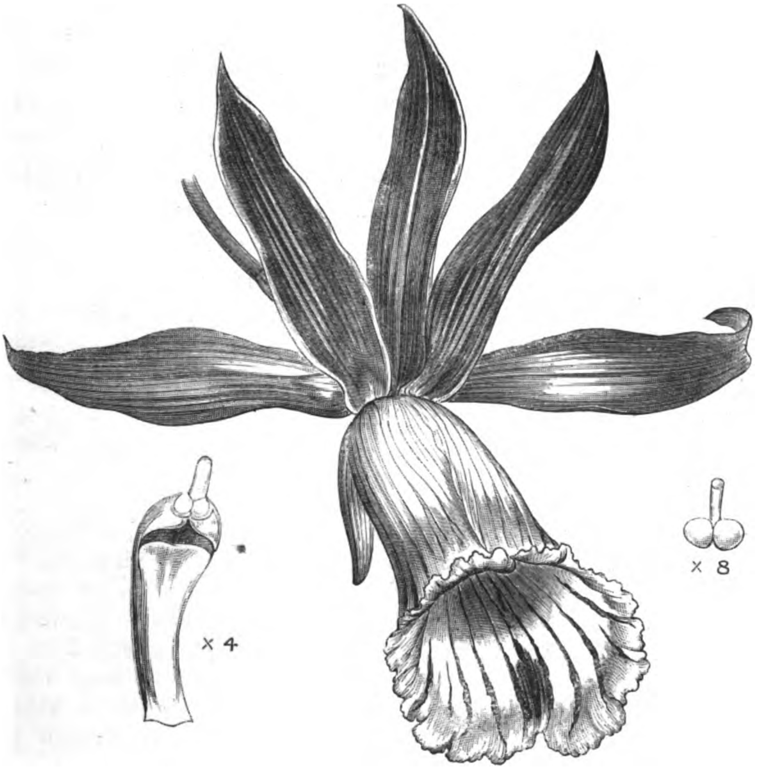
Stems tufted, as thick as the little finger at the base, attenuated and leafy upwards, 18—24 or more inches high. Leaves sheathing at the base, lanceolate, acuminate, 5—7 inches long. Peduncles terminal, few-flowered; bracts sheathing, linear, acuminate, pale brown. Flowers 3—4 inches across vertically; sepals and petals uniform, lanceolate, acute, brownish green, sometimes striated with light green; lip large, obscurely three-lobed, the side lobes convolute over the column into a wide tube that is produced into a short deflexed spur, the tube white, spur green; the front lobe deflexed, sub-quadrate, with four shallow lamellæ on its disk, white streaked with purple. Column narrowly winged, greenish spotted with purple.

Galeandra Devoniana, Schomb. ex Lindl. *Sert. Orch.* t. 37 (1838). Schomb. Reisen. III. p. 912. Paxt. *Mag. Bot. VIII,* p. 145. *Bot. Mag.* t. 4610. Warner's *Sel. Orch. I.* t. 37. Rchb. in Walp. Ann. VI. p. 649. *Illus. hort.* 1874, t. 176. *Lindenia, II.* t. 80 (var. Delphina).

A very handsome species that was first discovered by Schomburgk, who sent to Dr. Lindley the following particulars respecting it:—

"During our peregrinations we have seen this plant nowhere else than on the banks of the Rio Negro, a tributary of the Amazon,

> where in the neighbourhood of Barcellos we found it growing in large clusters on the trees which lined the river, sometimes on the *Mauritia aculeata*, or even on the ground where the soil consisted of vegetable mould. It was so luxuriant in growth that some of the large clusters of stems which sprouted from a common root were from 10—12 feet in circumference. The stems were often from 5—6 feet high; at the lower part almost of a purple appearance but changing into green higher up. As the flower is not only larger than the generality of its tribe, but handsome, I availed myself of this opportunity of naming it in honour of the Duke of Devonshire, one of the most successful cultivators of this, one of the most interesting tribes among monocotyledonous plants."

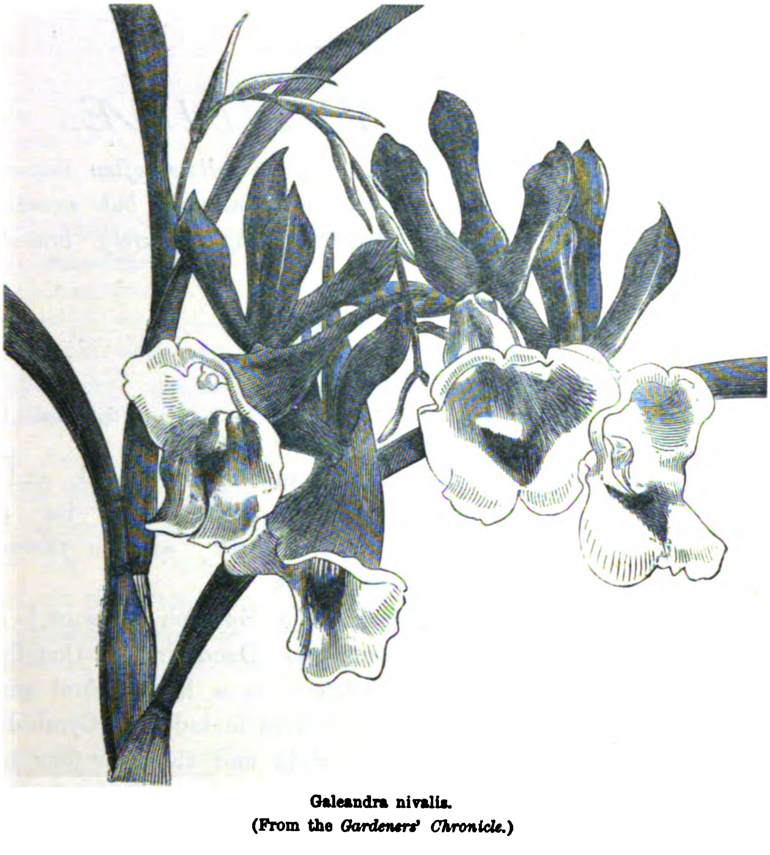


Galeandra Devoniana.

It was subsequently detected by the same energetic explorer in British Guiana, growing on the trunks of trees on the banks of the river Berbice; and afterwards by Spruce and Wallace in the same locality in which it was first discovered by Schomburgk, the first named of whom sent living plants to the Royal Gardens at Kew in 1851. It is occasionally imported from that locality along with *Cattleya superba* and *C. labiata Eldorado.*

G. nivalis.

Stems terete, 6—12 inches long, jointed at intervals of about an inch, the internodes invested with a whitish membraneous sheath.



Galeandra nivalis.
(From the *Gardeners' Chronicle.*)

Leaves linear, acute, 5—8 or more inches long. Racemes short, few-flowered; bracts linear, acuminate. Flowers 2 inches across vertically; sepals and petals similar and equal, narrowly oblong, acute, light olive-green; lip sub-orbicular, rolled over the column into a funnel-like tube and prolonged at the base into a slender yellow-green spur, white with a purple blotch on the disk, below which are two tooth-like tubercles prolonged into diverging lines to the base.

Galeandra nivalis, Hort. Gard. Chron. XVII. (1882), p. 537, with fig. *Illus. hort. XXXII.* (1885), t. 555.

We find nothing recorded of the origin of this elegant species nor any authority for the name. It flowered at Burford Lodge in the spring of 1882, on which occasion it was exhibited at a meeting of the Royal Horticultural Society and figured in the *Gardeners' Chronicle.* We are indebted to Sir Trevor Lawrence, Bart., for materials for description.

SUB-TRIBE CYMBIDIEÆ.

Terrestrial or more or less epiphyte. Stems foliate, often thickened into pseudo-bulbs. Leaves usually long and narrow, but sometimes broader, and plicately nerved. Racemes simple, rarely branched. Labellum not spurred.[*]

CYMBIDIUM.

Swartz. in K. Vet. Acad. Stockh. Nya. Handl. XX. p. 236 (1800), pro parte. Lindl. Gen. et Sp. Orch. p. 161 (1832). Benth. et Hook. Gen. Plant. III. p. 536 (1883).

The botanical history of Cymbidium is much complicated, and to follow the changes the genus has undergone since its first publication lies beyond the scope of this work; we can therefore only note a few of the most salient points.

The genus was founded by Swartz, the Swedish botanist,[†] and published by him at the same time as Dendrobium, Oncidium, Vanilla, and some others of less interest in a horticultural sense. Besides three genuine Asiatic species, Swartz included in Cymbidium three or four others of West Indian origin and three or four from South Africa, so that the genus was much mixed at the very beginning. This confusion continued to accumulate till Lindley dealt with the genus in his *Genera and Species of Orchidaceous Plants,* and even there, as he himself records that "Cymbidium as understood in that work is no doubt made up of several very different genera, the characters of which, from want of sufficient information, and the knowledge of a greater number of species, cannot be positively made out."* During the existence of the *Botanical Register*, Lindley removed many of the anomalies as materials came to hand, and many years later Reichenbach, in Walper's *Annales Botanices Systematicæ*, did much to reduce the genus to more natural limits. It remained for Mr. Bentham to circumscribe it as it now stands, the principal change made by him being the removal of Lindley's *Cymbidium elegans* and *C. Mastersii* to the Cyperorchis of Blume.

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[*] The chief character that separates this sub-tribe from the Eulophieæ is the absence of the spur in the labellum.

[†] *See* Dendrobium, p. 5.

The essential characters of Cymbidium are thus tersely stated by Sir J. D. Hooker:—†

> *Stem* very short, rarely elongate, and pseudo-bulbous. *Leaves* very long, narrow, and coriaceous, rarely short. *Scape* loosely sheathed; flowers often large, in sub-erect or drooping racemes.
>
> *Sepals* and *petals* sub-equal, free, erect or spreading.
>
> *Lip* sessile at the base of the column and embracing it upwards, base concave, side lobes erect, mid-lobe recurved; disk with usually two pubescent ridges.
>
> *Column* long and not produced into a foot; anther one- or imperfectly two-celled; pollinia 2, deeply grooved or 4, sub-globose or pyramidal, sessile on the broad strap or gland.

About thirty species are known to science, by far the greater number of which are dispersed over the Indo-Malayan region and tropical Australia, ascending to 5,000—6,000 feet on the Khasia Hills, and even higher on the Himalaya of Nepal and Sikkim; outlying species occur in Japan and New Caledonia. Some of the cultivated species are well known for their stately aspect and the imposing dimensions they attain.

Cultural Note.—The roots of Cymbidium are thick, fleshy and freely produced, ample pot-room should thence be provided for their development; they should also be allowed good drainage by means of broken crocks to not less than one-third of the depth of the pot. The compost should consist of fibrous loam and rough peat in the proportion of two-thirds of the former and one-third of the latter, many cultivators using in addition a little silver sand to assist drainage, and some use chopped living sphagnum in the place of rough peat. For those species whose habitat is on the Khasia Hills and the Nepalese Himalaya—*C. Devonianum*, *C. eburneum*, *C. giganteum*, etc.—an intermediate temperature is found to be most suitable, while the

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[*] Gen. and Sp. Orch. p. 161.

[†] Flora of British India, vol. VI. p. 8.

purely tropical species require more heat. The watering must be regulated according to the season of the year, the treatment of the Cymbidiums in this respect being much the same as that of the VERATRIFOLIÆ section of the Calanthes.*

Cymbidium canaliculatum.

"Stems nearly pseudo-bulbous, 1—3 inches long. Leaves linear, acute, the longest about a foot long. Raceme as long as the leaf, lax pendulous, many-flowered; pedicels very slender, together, with the short ovary an inch long. Flowers coriaceous, ¾ inch in diameter; perianth segments spreading, the petals rather smaller, elliptic-oblong, sub-acute, concave, brown with green margins; lip shorter than the petals, white with pinkish blotches, three-lobed, the lateral lobes narrow and small, the middle lobe ovate, sub-acute; disk with two low ridges. Column white, blotched with purple."—*Botanical Magazine.*

Cymbidium canaliculatum, R. Br. Prod. p. 331 (1810). Lindl. Gen. et Sp. Orch. p. 164. Müller Fragm. vol. V. p. 95. *Bot. Mag.* t. 5851. Benth. Fl. Austr. VI. p. 302.

Cymbidium canaliculatum is somewhat sparingly distributed over north and east Australia from Arnheim's Land and Cape York southwards to Hunter's River, in New South Wales, where it was first gathered by Bidwill; the geographical and also the climatic range of the species is therefore considerable. It was first discovered by Dr. Robert Brown in the beginning of the present century, near Cape York, in north-east Australia, and where in 1865 it was re-discovered by the late John Gould Veitch, who first introduced it to British gardens.

C. chloranthum.

Leaves ensiform, recurved, 15—20 inches long, sub-acute. Racemes as long as the leaves, erect or arching, many-flowered. Flowers 2 inches in diameter; sepals and petals nearly uniform, spreading, oblong, obtuse, yellow-green with a few red spots near the base; lip broadly oblong, three-lobed, the side lobes small, roundish oblong, incurved, red on the inside; the front lobe sub-quadrate, yellowish white spotted with red; disk with two crenulate lamellæ that extend to the base of the lip. Column semi-terete, yellow stained with red.

Cymbidium chloranthum, Lindl. in Bot. Reg. 1843, misc. No. 102. Id. in Journ. Linn. Soc. III. p. 29. *Bot. Mag.* t. 4907. Rchb. in Walp, Ann. VI. p. 623.

The origin of this is not certainly known; it was first cultivated by Messrs. Loddiges in 1843, and was reported by them to be a native of Nepal, but this habitat has not been confirmed by its discovery in that country since its first introduction. It has reappeared at intervals in several orchid collections both in this country and on the continent, and the plant may still be in cultivation. It is very near *Cymbidium canaliculatum*, a circumstance which suggests an Australian origin.

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* *See* Calanthe, p. 62.

C. Devonianum.

Stems obscurely pseudo-bulbous, each with 3—5 leaves. Leaves broadly strap-shaped, acute, 7—12 or more inches long, narrowed below into a channelled petiole about one-fourth as long as the blade. Racemes stoutish, as long as the leaves, quite pendulous, sheathed at the base with 3—5 brown membraneous boat-shaped scales. Flowers numerous, 1—1½ inch in diameter; sepals and petals similar, ovate-lanceolate, variable in colour, sometimes olive-green spotted with purple, sometimes buff-yellow streaked with vinous purple, the petals shorter and more acute than the sepals; lip obscurely lobed, shorter than the other perianth segments, broad ovate or sub-cordate; the blade reflexed, sometimes deep sanguineous purple, sometimes light rose-purple with a darker blotch near each lateral margin. Column bent, with two small rounded wings, greenish yellow with some red spots at the apex.

Cymbidium Devonianum, Paxt. *Mag. Bot. X.* p. 97 (1843). Lindl. in Gard. Chron. 1843, p. 431. Rchb. in Gard. Chron. XV. (1881), p. 375. Williams' *Orch. Alb. IV.* t. 170. Hook. f. Fl. Brit Ind. VI. p. 10.

Originally discovered by Gibson on the Khasia Hills, and introduced by him to Chatsworth in 1837, but where it did not flower till the spring of 1843. Gibson found it growing on the trunks of decayed trees and in the forks of the branches of old trees where some vegetable matter had accumulated. It was next gathered by Sir J. D. Hooker and Dr. Thomson on the Kollong Rock in the same region, at 5,000 feet elevation. The Kollong Rock is a very remarkable geological phenomenon; it is scarcely less interesting from a botanical point of view, on account of the number and variety of the orchids found on it and in its immediate vicinity. A brief account of it, extracted from the *Himalayan Journals* of Sir J. D. Hooker, may be suitably introduced here:—

> "The Kollong Rock is a steep dome of red granite, accessible from the north and east, but almost perpendicular to the southward, where the slope is 80° for 600 feet. The elevation is 400 feet above the mean level of the surrounding ridges, and 700 feet above the bottom of the valleys. The south or steepest side is encumbered with

enormous detached blocks, while the north is clothed with a dense forest containing red tree-rhododendrons and oaks. The hard granite of the top is covered with matted mosses, lichens, lycopodiums and ferns, amongst which are many curious and beautiful air plants, as Eria, Cœlogyne (*Wallichiana*, *maculata* and *elata)*, Cymbidium, Dendrobium, etc., some of them flowering profusely; and though freely exposed to the sun and wind, dews and frost, rain and droughts, they were all fresh, bright green and strong, under very different treatment from that to which they are exposed (1849—51) in the damp, unhealthy, steamy orchid houses of our English gardens."*

Cymbidium Devonianum appears to have been very rare in British gardens for many years after its first introduction till it was collected by Gustav Mann in Sikkim, and Freeman in Assam, 1868—75. The species is a variable one as regards the colour of the flower; its usual flowering season is April and May.

C. eburneum.

Stems obscurely pseudo-bulbous sheathed by the imbricating bases of the leaves. Leaves 9—15 to each growth, strictly linear, acute, 15—24 inches long. Peduncles stoutish, erect, much shorter than the leaves, sheathed by about three alternate, lanceolate, finely-acuminated bracts, sometimes one- usually two-flowered. Flowers 3 inches in diameter, very fragrant; sepals and petals similar, oblong or ovate-oblong, acute, ivory-white, the dorsal sepal concave and apiculate, the petals a little narrower than the sepals and sub-falcate; lip broadly ovate-oblong, three-lobed, the side lobes incurved towards the column, ivory-white, the intermediate lobe with crisped margin, ivory-white, sometimes with some scattered purple dots around the ochraceous disk; crest an oblong, fleshy, grooved and pubescent, yellow plate, thickened at the apex, and with three raised lines extending the whole length. Column clavate, triquetral, with two narrow wings, white above, concave in front with a purple stain.

Cymbidium eburneum, Lindl. in *Bot. Reg.* 1847, t. 67. Id. in Journ. Linn. Soc. III. p. 28 (1858). Paxt. *Mag. Bot. XV.* p. 145 (1849). *Bot. Mag.* t. 5126 (1859). Warner's *Sel. Orch. I.* t. 27. Jennings' *Orch.* t. 16. Regel's Gartenfl. (1880), p. 155, icon. xyl. Gard. Chron. XVII. (1882), p. 496, with fig. Id. XX. (1884), p. 77, with fig. Hook. f. Fl. Brit. Ind. VI. p. 11.

var.—Dayi.

Leaves narrower and longer; flowers ivory-white with a row of purple spots on each side of the disk of the lip.

C. eburneum Dayi, Jennings' *Orch.* t. 16. C. Dayanum, Rchb. in Gard. Chron. 1869, p. 710.

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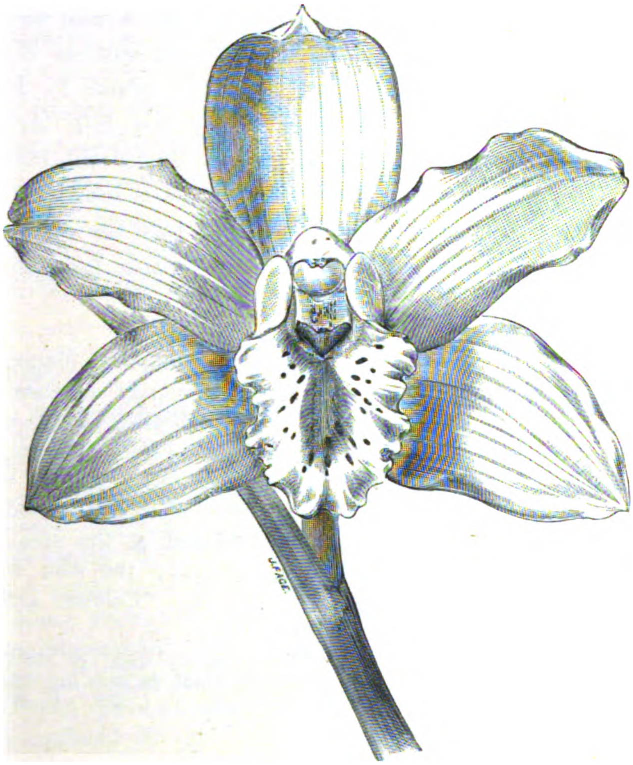
* Vol. II. p. 295.

var.—Parishii.

Leaves broader and shorter; disk of the lip orange-yellow spotted with purple, the marginal area on each side also spotted with purple.

C. eburneum Parishii, Hook. f. Fl. Brit. Ind. VI. p. 12. C. Parishii, Rchb. in Trans. Linn. Soc. p. 144 (1873). Id. Xen. Orch. III. p. 55. t. 224. Id. in Gard. Chron. X. (1878), p. 74. Williams' *Orch. Alb. I.* t. 25.

Cymbidium eburneum, formerly so rare, is now one of the most generally cultivated species in the genus. It was originally discovered by the excellent botanical explorer, William Griffith, about the year 1837, at Myrung on the Khasia Hills, at 5—6,000 feet elevation, but ten years elapsed before its beautiful fragrant flowers were seen in British gardens, the first occasion of its flowering in this country being in the spring of 1847 in the nursery of Messrs. Loddiges at Hackney. For many years afterwards it continued to be very rare in the orchid collections of Europe till easier access to its habitat and quicker transport of plants to Europe caused importations to



Cymbidium eburneum.

become more frequent. Its discovery in Sikkim by Mr. C. B. Clarke and its presence in Moulmein indicate a more extensive range of the species than was at first suspected.

The origin of the variety *Dayi* is vaguely stated to be Assam, whence it was obtained by the late Mr. John Day, through his nephew, Captain Williamson, of the Indian army, who sent him many orchids from that region. The variety *Parishii* is a remarkable one both in a horticultural and geographical sense, affording another instance of the presence of the same species in Assam and Moulmein. According to Reichenbach it was one of the earliest discoveries of the Rev. C. S. Parish, who in 1867 sent two plants to Messrs. Low, of Clapton, one of which was acquired by the late Mr. John Day, in whose collection at Tottenham it did not flower till 1878. A plant in Mr. W. Leach's collection at Fallowfield, Manchester, had, however, flowered a short time previously, and this was the first time of its flowering in England; it is still rare in British gardens.

C. Finlaysonianum.

Leaves 20—30 inches long, ensiform, obliquely obtuse, coriaceous. Racemes about 2 feet long, the rachis obscurely angulate, pale green, pendulous, and many-flowered; basal sheaths short and inflated. Flowers 2 inches in diameter; sepals and petals linear-oblong, obtuse or sub-acute, dull tawny yellow, sometimes with a reddish median line; lip three-lobed, the side lobes oblong, erect, deep vinous red; the intermediate lobe oblong, apiculate, much reflexed at the apex, white with a yellow disk and vinous purple apical spot; the disk with two red ridges that extend to the base of the lip. Column arched, reddish purple above, spotted below the stigma.

Cymbidium Finlaysonianum, Lindl. Gen. et Sp. Orch. p. 164 (1832). Hook. f. Fl. Brit. Ind. VI. p. 11. C. pendulum, Lindl. in *Bot. Reg.* 1846, t. 25. Id. 1844, t. 24 (brevilabre). Williams' *Orch. Alb. X.* t. 437. C. Wallichii, Lindl. Gen. et Sp. Orch. p. 165.

var.—atropurpureum.

Leaves narrower and longer. Racemes longer with larger flowers; sepals and petals maroon-purple with a rich velvety gloss, the front lobe of the lip white with a few purple spots.

C. Findlaysonianum atropurpureum, supra. C. pendulum atropurpureum, Lindl. in Gard. Chron. 1854, p. 287. *Bot. Mag.* t. 5710.

The plant we have described above is the *Cymbidium pendulum* figured in the *Botanical Register* of 1840, and again in the same serial of 1844; the first drawing was made from a specimen sent to Dean Herbert by Dr. Wallich, and the second from a plant sent from Singapore to Messrs. Loddiges by Cuming, the object of the second plate being to show the variability of the species. It is also that which is cultivated in gardens under the name of *C. pendulum,* but unfortunately the name cannot be retained for this species. On reference to Lindley's types preserved in the Herbarium at Kew, it is clear that *his C. pendulum,* that is, the plant now under notice, is not the species so named by Swartz, but it is that discovered by Finlayson in Cochin China in the early part of the present century, and named after him by Lindley. It appears to have an extensive range in Malaysia.

The variety *atropurpureum,* which is a very handsome one, has long been known in the orchid collections of Europe; it was cultivated in 1854 by Mr. John Knowles, of Manchester, who had received it from Borneo, but according to Dr. Lindley it had been collected by Cuming in the Philippine Islands many years previously. Our knowledge of it is derived from an exceptionally fine form in the collection of Baron Schroeder, at The Dell, Staines.

C. giganteum.

Stems pseudo-bulbous, compressed, 4—6 inches long. Leaves linear-ligulate, acute, 24—30 or more inches long, convolute into a tube and yellowish to 3—4 inches from the base, distinctly keeled on the under side. Scapes robust, as long as the leaves, sheathed below with brown, membraneous, ovate-oblong, acute bracts 2—2½ inches long; raceme 7—10 or more flowered. Flowers distant, 3—4 inches across; sepals and petals light yellow-green striped longitudinally with red, the former oblong, acute, the latter narrower, linear-oblong, acute, sub-falcate; lip oblong, three-lobed, the side lobes erect, coloured like the sepals and petals; the middle lobe downy above, reflexed with undulate and ciliate margin, yellow spotted with red, disk with two ciliated lamellæ that are confluent at their apices. Column clavate, arched, terete, and pale yellow above, concave and streaked below the stigma.

Cymbidium giganteum, Lindl. Gen. et Sp. Orch. p. 163 (1832). Id. *Sert. Orch.* t. 4. *Bot. Mag.* t. 4844 (1855). Paxt. *Mag. Bot. XII.* p. 241 (1846). Rchb. in Walp. Ann. VI. p. 626. Williams' *Orch. Alb. VI.* t. 284. Hook. f. Fl. Brit. Ind. VI. p. 12. Iridiorchis gigantea, Blume, *Orch. Arch. Ind.* p. 91. t. 26.

This striking Cymbidium is a native of the tropical Himalaya from Kumaon in Nepal eastwards to Bhotan and the Khasia Hills, ascending to 4,000—5,500 feet; its lowest observed vertical range being in Sikkim where it descends to 1,000 feet; it is essentially a mountain plant, never spreading into the plains, and always inhabiting the jungle at a short distance from the ground. Its climatic range is considerable:—At Kollong on the Khasia Hills the rainfall from April to November is about 90 inches, and the daily temperature is 19°—21° C. (65°—70° F.), rarely rising to 26° C. (80° F.); from November to April the season is almost rainless, and the temperature in January and February falls below zero C. (32° F.) nearly every night. In Sikkim the rainfall during the same period reaches almost 150 inches, and in the summer months the temperature often rises to 32° C. (90° F.); the winter months are not quite rainless and the temperature never sinks to the freezing point.

Cymbidium giganteum was first discovered by Dr. Wallich in 1821, and subsequently introduced by him into British gardens. It was sent to Chatsworth in 1837 by Gibson, who found it on the Khasia Hills "in great abundance in the thick umbrageous forests growing on the trunks of trees, and especially upon those which had began to show tokens of decay; the specimens which occupied the hollows of old trees partially filled up with decomposing vegetable matter, always presenting the most luxuriant and healthy appearance." The illustrations quoted above show that the flowers vary considerably in depth of colouring.

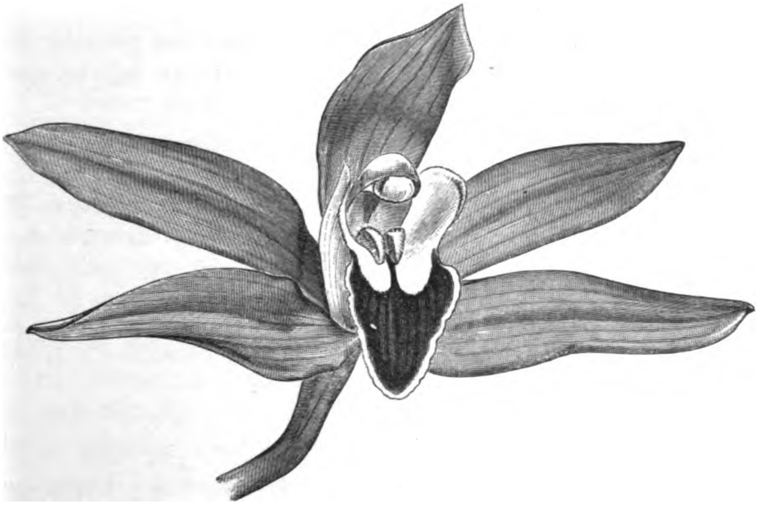
C. grandiflorum.

Leaves 20—25 inches long, ligulate, acute, dilated below into ribbed and grooved sheaths striated with two shades of green. Scapes very robust, sheathed below by long and narrow acuminate bracts; racemes nodding, 7—12 flowered. Flowers the largest in the genus, 4—5 inches across; sepals and petals similar and sub-equal, oblong, acute, green, the petals a little narrower than the sepals; lip three-lobed, triangular, acute, ciliolate at the margin, light yellow with lines of red-purple dots on the inner side; the intermediate lobes cordate, crisped and fringed at the margin, yellow spotted with red-purple; between the side lobes are two ciliated lamellæ as long as the lobes themselves. Column terete and green above, spotted with red below the stigma.

Cymbidium grandiflorum, Griff. Notul. III. p. 342 (1851), and Icon. Plant. Asiat. t. 321. Hook. f. Fl. Brit. Ind. VI. p. 12. Gard. Chron. XI. s. 3 (1892), p. 267. C. Hookerianum, Rchb. in Gard. Chron. 1866, p. 7. Batem. in *Bot. Mag.* t. 5574. C. giganteum (in part), Lindl. in Journ. Linn. Soc. III. p. 29.

An old denizen of British gardens, but which has never received much attention from the cultivators of orchids, chiefly on account of the prevailing green colour of its flowers, which are also slow to expand. It was introduced by our Exeter firm through Thomas Lobb, the first plant flowering at Chelsea in 1866, on which occasion it was described by Reichenbach in the *Gardeners' Chronicle* under the name of *Cymbidium Hookerianum,* in compliment to Dr. (now Sir Joseph) Hooker, who had then but recently succeeded his father in the Directorship of the Royal Gardens at Kew. The plant had, however, been many years previously registered by Griffith, its original discoverer, as *C. grandiflorum* in the publications quoted above.

Its habitat is the eastern Himalaya, ascending to 5,000—7,000 feet in East Nepal, Sikkim, and Bhotan, growing under the same climatic conditions and local environment as *Cymbidium giganteum.*



Cymbidium Lowianum.

C. Lowianum.

Stems and leaves as in *Cymbidium giganteum.* Racemes robust, arching, bearing 18—25 flowers. Flowers 3—4 inches across transversely; sepals and petals similar, oblong-lanceolate, acute, greenish-yellow with reddish veins, the sepals obscurely keeled behind, and the petals a little narrower than the sepals; lip three-lobed, the side lobes roundish-oblong, erect, light buff-yellow; the intermediate lobe deltoid, reflexed with slightly undulate margin, and covered with a velvety pubescence, dark red-crimson with a pale buff-yellow margin, white at the base;

crest two-keeled, the keels convergent towards their apices. Column triquetral, arched, concave below the stigma, yellow spotted with red.

Cymbidium Lowianum, Rchb. in Gard. Chron. XI. (1879), pp. 321 and 405, with fig. *Fl. Mag.* N.S. t. 353. C. giganteum Lowianum, Rchb. in Gard. Chron. VII. (1877), p 685. Hook. f. Fl. Brit. Ind. VI. p. 13.

sub.-var.—*concolor* (Gard. Chron. IX. s. 3 (1891), p. 107), the apical area of the lip bright buff-yellow, all traces of the red-crimson entirely absent.

Cymbidium Lowianum was sent to Messrs. Low from Burmah, in 1877, by Boxall; it flowered for the first time in this country in their Clapton nursery in the spring of 1879. It has since been detected by our own collector on the hills around Bhamo in some places associated with *C. grandiflorum,* growing under much the same conditions as observed by Gibson on the Khasia Hills. As a horticultural plant *C. Lowianum* is unquestionably superior to its near ally *C. giganteum;* its longer racemes of brighter coloured flowers, the length of time they continue in perfection and the pleasing habit of the plant all combine to render it when in flower one of the most striking objects in the orchid house.

Cymbidinm giganteum, C. grandiflorum, C. Lowianum and *C. longifolium,* the last named rare in cultivation, form a very natural group of Cymbids, all inhabiting the tropical Himalaya from Nepal to north-east Burmah under much the same conditions of climate and environment. It is a question whether they should be regarded as specifically distinct or only as varieties of one well-defined type; we incline to the latter view, a view strengthened by the recent appearance of an intermediate form in *C. Traceyanum.* For horticultural convenience it is doubtless best to keep them distinct for the present.

C. madidum.

Stems pseudo-bulbous, sub-cylindric, 3—4 inches long. Leaves ensiform, sub-erect, 20—30 inches long, sheathing at the base. Racemes pendulous, as long as the leaves, many-flowered. Flowers an inch in diameter; sepals and petals oval-oblong, obtuse, dull nankeen-yellow, the sepals spreading, the petals smaller and erect; lip obscurely three-lobed, the side lobes rotund, erect, stained with vinous purple; the intermediate lobe roundish-oblong, coloured like the sepals and petals; lamellæ none, "in room of which is a shining exudation all along the axis."

Cymbidium madidum, Lindl. in Bot. Reg. 1840, misc. p. 9. Rchb. in Walp. Ann. VI. p. 624. Rolfe in Gard. Chron. VI. s. 3 (1889). p. 406. C. albucæflorum, F. Muell. Fragm. Phyt. Austral. I. p. 188. Benth. Fl. Austral. VI. p. 303.

This was first imported by Messrs. Rollisson in 1840, but seems to have been soon lost to cultivation. Its re-appearance in British gardens is a matter of some interest, as its identity with the *Cymbidium albucæflorum* of Mueller and therefore its north Australian origin is now proved. We are indebted for materials for description to Mr. G. C. Raphael, of Castle Hill, Englefield Green.

C. pendulum.

Stems pseudo-bulbous, 2—3 inches long, sheathed by the bases of the lowermost leaves. Leaves broadly linear, distichous, equitant at base, 12—20 or more inches long, very rigid, sub-erect and obliquely two-lobed at the apex. Racemes shorter than the leaves, pendulous or decurved, many-flowered. Flowers 1½—2 inches in diameter; sepals and petals narrowly oblong, acute, recurved at the tips, light yellow with a vinous purple median band, often striated or broken into streaks; the petals somewhat shorter and more acute than the sepals; lip elliptic-oblong, obscurely three-lobed, dark plum-purple with pale yellow longitudinal lines; the side lobes narrow, erect, the front lobe or epichile small, sub-quadrate, reflexed with two yellow bilobate calli at its base. Column vinous purple, anther yellow.

Cymbidium pendulum, Swartz. in Nov. Act. VI. p. 73 (1800). Lindl. Gen. et Sp. Orch. p. 165. Rchb. in Walp. Ann. VI, p. 624 (excl. var. brevilabre). C. aloifolium, Hook. f. Fl. Brit. Ind. VI. p. 10 (not of Sw.). Epidendrum pendulum, Roxb. Corom. Pl. I. p. 35, t. 44. E. aloides, Curtis in *Bot. Mag.* t. 387 (1797).

Much confusion exists respecting the identity of this species which has been known in gardens for upwards of a century as *Cymbidium aloifolium*. It is, moreover, encumbered with a tangled synonymy, which it is impossible to unravel without a careful examination and comparison of original types preserved in herbaria. This research has been recently undertaken by Mr. Rolfe, of the Kew Herbarium, and we unhesitatingly accept his decision. The species here described is beyond question the true *C. pendulum* of Swartz, not of Lindley, the latter being now referred to *C. Finlaysonianum*; it has been confused with the last-named species and with the closely allied *C. aloifolium* of Swartz, the *C. bicolor* of Lindley, whose habitat is restricted to southern India and Ceylon, and which has not, so far as we can discover, been in cultivation.

Cymbidium pendulum (as here understood) has been gathered in many localities in the lower Himalayan zone from eastern Nepal to Sikkim, and from Assam southwards as far as Tenasserim and the Andaman Islands; it also occurs in southern China. Although of inferior merit as a horticultural plant it is especially interesting as being one of the first Cymbidiums introduced into British gardens.

A few years prior to 1797 a plant was sent from India to Mr. Vere, of Kensington, who did not succeed in flowering it up to that date, but in that year it flowered in the nursery of Messrs. Grimwood and Wykes at Kensington, on which occasion it was figured in the *Botanical Magazine*.

C. tigrinum.

Pseudo-bulbs ovoid, 1—1½ inch long, each bearing 3—5 oblong-lanceolate, recurved leaves 3—6 inches long. Scapes slender, sub-erect, longer than the longest leaves, 3—5 flowered; bracts small, ovate-lanceolate. Sepals and petals similar and sub-equal, linear-oblong, acute, 2 inches long, olive-green, paler at the margin and spotted with red at the base; the petals sometimes paler and with more spots than the sepals; lip oblong, three-lobed, the side lobes rotund, erect, yellow striped obliquely with broad red-brown bands; the intermediate lobe sub-quadrate, apiculate, reflexed, white with short brown-purple transverse streaks; between the side lobes are two raised white lines. Column clavate, arched, pale olive-green above, spotted with red below the stigma.

Cymbidium tigrinum, Parish, MS. in *Bot. Mag.* t. 5457. Hook. f. Fl. Brit. Ind. VI. p. 9.

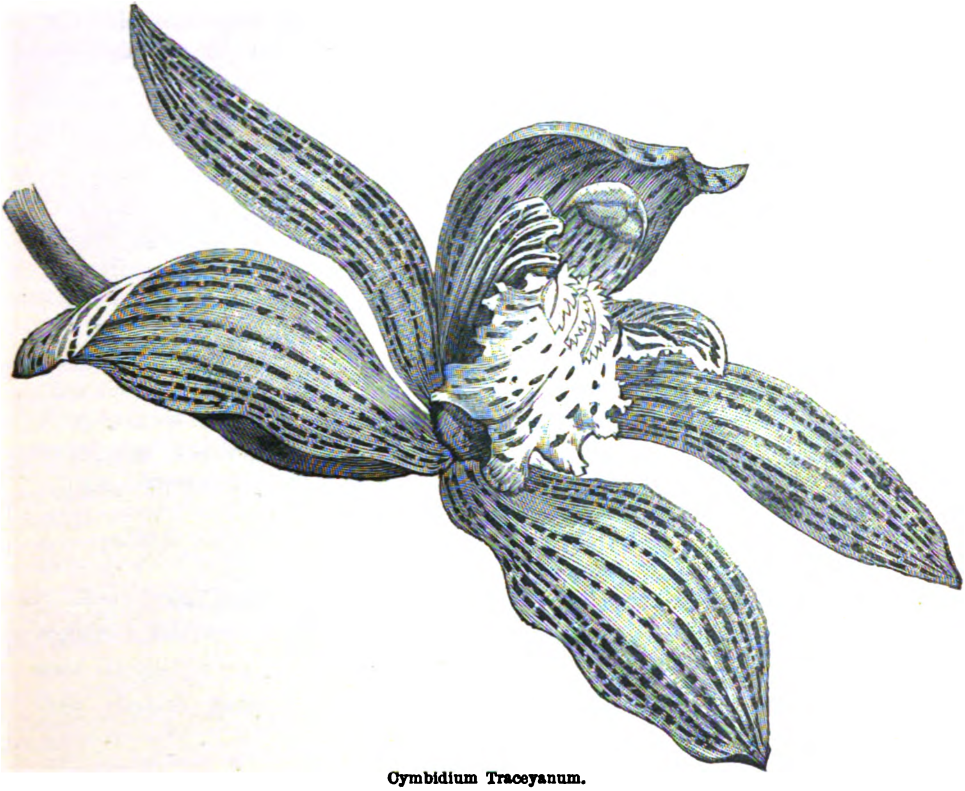
Discovered in 1863 by the Rev. C. S. Parish upon rocks on the mountains of Tenasserim at 6,000 feet elevation, and sent by him to Messrs. Low, of Clapton. It is one of the most distinct of Cymbidiums, but not often seen in cultivation. We are indebted to Mr. F. Wigan, of Clare Lawn, East Sheen, for materials for description.

C. Traceyanum.

Stems and leaves as in *Cymbidium giganteum.* Racemes 3—4 feet long, bearing 16—20 flowers. Flowers 4—5 inches across; the sepals and petals greenish yellow with longitudinal lines of red-crimson dots and streaks, the sepals oblong, acute, the petals similar but much narrower; lip three-lobed, the side lobes roundish oblong, light yellow, obliquely streaked with red-crimson; the intermediate lobe broadly oblong, reflexed, crisped and fringed at the margin, cream-white spotted with red-crimson. Column greenish spotted with red.

Cypripedium Traceyanum, Hort. Gard. Chron. VIII. s. 3 (1890), p. 718.

A very handsome Cymbidium, very near *Cymbidium grandiflorum* and intermediate between that species and *C. giganteum.* It was acquired at a sale of *C. Lowianum* by Mr. A. H. Tracey, of Twickenham, and was not distinguishable from it till it flowered. The plant, the only one known, is now in the magnificent collection of Baron Schroeder at The Dell.



Cymbidium Traceyanum.
(From the *Gardeners' Magazine.*)

HYBRID CYMBIDIUMS.

Three hybrid Cymbidiums artificially obtained are known to us, of which two have flowered, both of them taking a high rank among hybrid orchids for elegance and distinctness; in both cases the progeny was very restricted in numbers but very vigorous in growth.

Cymbidium eburneo-Lowianum.

Parentage expressed by the name.

Pseudo-bulbs and leaves intermediate between those of the two parents, with the yellowish striations at the base characteristic of *Cymbidium Lowianum.* Racemes longer than in *C. eburneum,* and bearing more flowers. Flowers equal in size to the best *eburneum* forms; sepals and petals similar and sub-equal, oblong, lanceolate, light nankeen-yellow, the petals and lateral sepals spreading, the dorsal sepal bent forward; lip nearly as in *C. Lowianum*, ivory-white on the inner side with a V-shaped red-crimson blotch on the reflexed front lobe; lamellæ of the disk bright yellow. Column ivory-white with a reddish stain below the anther.

Cymbidium eburneo-Lowianum, Gard. Chron. V. s. 3. (1889), p. 363.

C. Winnianum.

C. giganteum × *C. eburneum*.

Stems and leaves nearly as in *Cymbidium eburneum*. Racemes robust, nearly as long as the leaves, 10—15 flowered; bracts much acuminated as in *C. eburneum*. Flowers of the general shape of those of *C. giganteum* with all the segments narrower, 4 inches across transversely; sepals and petals ivory-white, the dorsal sepal narrowly oblong, the lateral two similar but sub-falcate; the petals linear-oblong, and falcately curved; lip nearly as in *C. giganteum*, ivory-white rather densely spotted with crimson along the base of the side lobes and the crisped margin of the front lobe; between the side lobes are two pubescent orange-yellow lamellæ that are confluent and almost hirsute at their apex. Column semi-terete, bent, narrowly winged, greenish above, spotted with crimson below the stigma.

Raised by Mr. Charles Winn, of Selly Hill, Birmingham.

Cymbidium Winnianum, supra.

CYPERORCHIS.

Blume, Mus. bot. Lugd. I. p. 48. (1849). Benth. et Hook. Gen. Plant. III. p. 538.

This genus was founded by the Dutch botanist, Blume, on *Cymbidium elegans* (Lindl.), to which were afterwards added *C. Mastersii* (Griff.), and *C. cochleare* (Lindl.), the latter species of no horticultural merit. These three species are separated from Cymbidium chiefly by their narrow perianth segments which are connivent to the middle or beyond it; the flowers, therefore, do not fully expand like those of a true Cymbidium; also by the straight narrow lip of which the front lobe or epichile is very short, and by their much more dense racemes. They are all natives of the sub-tropical Himalaya and the Khasia Hills, ascending to 4,000—6,000 feet.

Cultural Note.—The cultural treatment of the two species described below is precisely the same as that applied to the Cymbidiums from the same region and altitude.

Cyperorchis elegans.

Stems short, sheathed at the base by the brown, distichous, truncate bases of the fallen leaves, becoming with age a sub-conic, tapering pseudo-bulb, 2—3 inches long. Leaves numerous, linear, bifid at the tip, 15—20 inches long, pale striated yellow-green at the base on the under side, grass-green above. Scapes shorter than the leaves, sheathed at the base by brown acuminate scales. Racemes dense, pendulous, many-flowered. Flowers 1½ inch long, of a uniform light ochreous yellow; sepals and petals similar, linear-oblong with acute, recurved tips; lip narrowly wedge-shaped, three-lobed, the side lobes very narrow, the front lobe short, oblong, obtuse, with two close, orange raised lines on the disk. Column slender, terete above, nearly flat on the side opposite the lip.

Cyperorchis elegans, Blume, Orch. Archip. Ind. p. 93. t. 48C, icon analyt. (1849). *Bot. Mag.* t. 7007. Hook. f. Fl. Brit. Ind. VI. p. 14. Cymbidium elegans, Lindl. Gen. et Sp. Orch. t. 163. Id. *Sert. Orch.* t. 14. Id. in Journ. Linn. Soc. III. p. 28. Rchb. in Gard. Chron. III. (1875), p. 429.

Cyperorchis elegans was originally discovered by Dr. Wallich, in 1821, in the forests of Nepal. Then Griffith detected it on the Khasia Hills near Myrung in 1835; it was afterwards gathered by Sir Joseph Hooker in Sikkim (1849) and much more recently by Mr. C. B. Clarke in Manipur; other localities are also given in which it has been found by Indian botanists and explorers in the same region. Its range therefore in the lower Himalayan zone and north-east Bengal is considerable. We find no record of its first introduction into British gardens.

C. Mastersii.

Stems ligneous, 4—9 or more inches high and ¾—1 inch in diameter. Leaves distichous and closely imbricating at the base, arching or sub-erect, 20—30 inches long, acute. Racemes short, 7—10 flowered; basal sheaths 3—4, lanceolate, acuminate, pale green. Flowers about 2 inches long, ivory-white, usually with some rose-purple spots on the lip, almond-scented; sepals and petals linear-oblong, the petals a little the narrower; lip slightly saccate at the base, three-lobed, the side lobes roundish-oblong, partially embracing the column, the front lobe (epichile) oval, reflexed with undulate margin; disk with two orange raised lines evanescent below. Column terete and green above, almost flat below the stigma, bent at the apex.

Cyperorchis Mastersii, Benth. in Journ. Linn. Soc. XVIII. p. 318 (1881). Hook. f. Fl. Brit. Ind. VI. p. 15 (1890). Cymbidium Mastersii, Griffith M.S. ex Lindl. in *Bot. Reg.* 1845, t. 50. Lindl. in Gard. Chron. 1845, p. 643. Id. in Paxt. *Fl. Gard. III.* t. 78. *Fl. Mag.* N.S. t. 391. *Lindenia, V.* t. 222. Sander's *Reichenbachia, II.* t. 66 (album). C. affine, Williams' *Orch. Alb. III.* t. 140. *Fl. Mag.* N.S. t. 346.

For the discovery of this beautiful orchid both science and horticulture are indebted to the energetic Indian explorer William Griffith, who met with it on the Khasia Hills about the same time as *Vanda cœrulea,* 1836—37. It also occurs in Sikkim and Manipur, its vertical range being 4,000 — 6,000 feet; it usually affixes itself to the stems and branches of trees, often 20—30 feet from the ground, growing under the same climatic conditions as those stated under *Cymbidium giganteum.* It was imported by Messrs. Loddiges in 1841, but it did not flower till December, 1844; it continued to be a rare plant in British gardens for some years afterwards, till collected by Simons in Assam in 1856—57. It was named by Mr. Griffith after Mr. Masters, one of the principal superintendents of the Botanic Garden at Calcutta, during the Directorship of Dr. Wallich.

ANSELLIA.

Lindl. in Bot. Reg. 1844, sub. t. 12. Benth. et Hook. Gen. Plant. III. p. 537.

Among those who accompanied the ill-fated Niger expedition of 1841—42 was Mr. Ansell, a gardener, who, when at Fernando Po, found in Clarence Cove, growing on the stem of an oil palm (*Elæis guineensis*) an epiphyte of which a dried specimen came into the possession of Dr. Lindley. On this specimen he founded the genus Ansellia in commemoration of the discoverer.

Two years later living specimens, whose origin is not stated but undoubtedly west African, which had been received by the Rev. John Clowes and Messrs. Loddiges, flowered for the first time and one of Loddiges' plants was figured in the *Botanical Register* of 1846, t. 30, under the name of *Ansellia africana.* But on comparing this figure with the Fernando Po type specimen preserved in Lindley's herbarium at Kew, it is evident that it does not represent the original *A. africana,* but another form for which Mr. N. E. Brown has proposed the name of *A. confusa.* It is this form that is best known in gardens as *A. africana.* Quite recently a plant collected by the Earl of Scarborough on the banks of the Haka river, Elephant Forest, near Lake Chad, and sent to Kew for identification, proves to be this *A. confusa.*

In the meantime an Ansellia had been received by the late Mr. Wilson Saunders from Natal, and which had been discovered by the German traveller Gueinzuis, but not introduced by him. This is the same as that described by Reichenbach in Walper's *Annales Botanices* under the name of *Ansellia gigantea.* It is this form that is represented by a single flower in plate 4965, fig. 3, of the *Botanical Magazine* and is named by Sir W. Hooker *A. africana*, var. *natalensis.*

Some years later another Ansellia was detected by Speke and Grant during their expedition to the Upper Nile in 1860—63 (*A. nilotica*). And lastly, not long ago an Ansellia was introduced from the Congo by the Compagnie Continentale d'Horticulture de Gand (*A. congoensis*) Thus the genus is shown to be represented in at least five localities or regions in Africa widely remote from each other, and plants from all of them have been, and probably may be still in cultivation. That these Ansellias are very closely related to each other is so manifest that the observed structural differences in their flowers seem barely sufficient to entitle them to separate specific rank; but we agree with Mr. N. E. Brown that they cannot at present be accepted as mere varieties of the original type, although admitting the extreme possibility of their being ultimately connected by intermediate forms.

Ansellia is closely allied to Cymbidium, from which its very different habit, its terminal inflorescence, and its bipartite (= four) pollinia chiefly distinguish it.

Cultural Note.—Ansellia africana and its varieties require the highest temperature available in the orchid houses of Europe; in other respects the cultural treatment is precisely the same as that of the Cymbidiums.

Ansellia africana.

Stems tufted, 18—25 or more inches long, cylindric, as thick as a man's thumb, sheathed by the long withered bases of the fallen leaves. Leaves from the upper portion of the stem ligulate-lanceolate, acute, 5—7 or more inches long, usually five-nerved. Peduncles terminal, as long as the leaves, panicled, many-flowered. Flowers 2 inches in diameter, light yellow-green spotted with brown-purple; sepals narrowly oblong; petals elliptic-oblong, as broad again as the sepals; lip three-lobed, the side lobes oblong, erect; the intermediate lobe ovate, reflexed with two keels on the disk and four or five folds in front of them. Column elongate, terete above, concave on the face.

Ansellia africana, Lindl. in *Bot. Reg.* 1844, sub. t. 12. *Bot. Mag.* t. 4965.* excl. fig. 3. N. E. Brown in Lindenia, II. sub t. 64.

A. confusa.

Stems and leaves longer than in *Ansellia africana*, the latter also narrower and more acuminate. Flowers smaller with the sepals and petals similar and sub-equal, narrowly oblong, obtuse, light yellow-green spotted with brown-purple; lip three-lobed, the side lobes coloured like the sepals and petals, the front lobe bright yellow with two keels on the disk, and the marginal area verrucose.

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* The plant here figured seems well-nigh intermediate between the typical *Ansellia africana* and *A. confusa.*

Ansellia confusa, N. E. Br. in Lindenia, II. sub. t. 64. **A. africana**, Lindl. in *Bot. Reg.* 1846, t. 30. Paxt. *Mag. Bot. XIII.* p. 241. Regel's *Gartenfl. III.* t. 95. Williams' *Orch. Alb. VIII.* t. 367.

A. congoensis.

Stems shorter and stouter than in *Ansellia africana.* Leaves linear, acuminate, 12—15 inches long with three pale nerves. Racemes simple, many-flowered. Flowers 1¼ inch in diameter; sepals and petals similar and sub-equal, pale yellow spotted with chocolate-brown, the apical spots the larger, oval-oblong, acute; the sepals keeled behind, the petals a little broader and not keeled; lip three-lobed, the side lobes oblong, erect, light yellow heavily striped with red-brown on the inner side; the intermediate lobe narrower than in *A. africana,* obovate with two longitudinal keels, bright yellow. Column clavate, yellowish.

Ansellia congoensis, Rodigas in Illus. hort. XXXIII. p. 143 (1886). *Lindenia, II.* pl. 64.

A. gigantea.

Stems, leaves and inflorescence as in *Ansellia africana.* Flowers smaller with narrower segments; sepals and petals oblong, obtuse, pale yellow, or yellowish green with small red-brown spots on the basal half only; lip three-lobed, deeper yellow than the other segments, the disk with three keels and not crisped at the margin.

Ansellia gigantea, Rchb. in Walp. Ann. VI. p. 627. Id. in Gard. Chron. IX. (1878), p. 398. Saunders' *Ref. Bot. II.* t. 136. N. E. Brown in Lindenia, II. sub. t. 64. **A. africana natalensis**, Hook. in *Bot. Mag.* t. 4965, fig. 3.

A. nilotica.

Stems, leaves and inflorescence as in *Ansellia africana;* sepals and petals narrowly oblong, canary-yellow heavily blotched with chocolate-brown; lip nearly as in *A. gigantea,* bright canary-yellow with three keels on the disk and verrucose in front of them.

Ansellia nilotica, N. E. Brown in Lindenia, II. sub. t. 64. **A. africana nilotica**, Baker.

GRAMMANGIS.

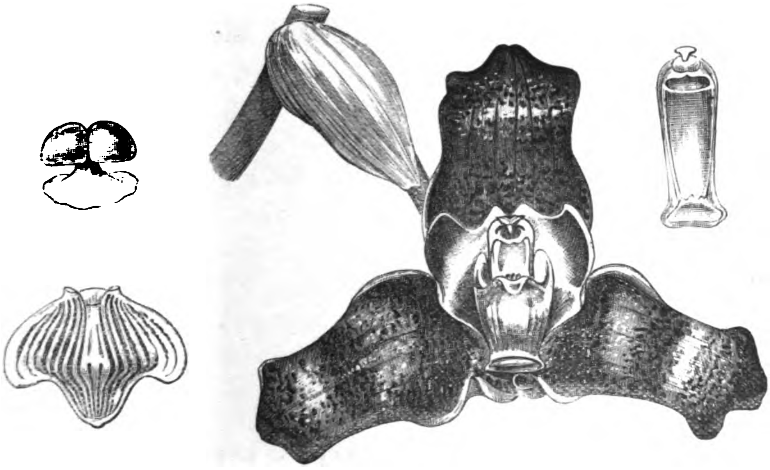
Rchb. in Xen. Orch. II. p. 17 (1862). Benth. et Hook. Gen. Plant. III. p. 537. (excl. sp. javanica).

Among the orchids allied to Cymbidium is the remarkable one discovered and introduced many years ago by the Rev. W. Ellis, from Madagascar, and which Lindley referred to the Malayan genus

Grammatophyllum; but on account of the very different form of its perianth, Reichenbach separated it from that genus and founded upon it a new genus with the above name.* Mr. Bentham would also join with it *Cymbidium Huttonii* figured in the *Botanical Magazine* of 1867, t. 5676, a plant of Malayan origin introduced by us through Hutton, but which has long since disappeared from cultivation, and which if re-introduced would probably receive separate generic rank. Of the propriety of separating the Madagascar plant from Grammatophyllum, a comparison of the woodcuts given below of that and the Malayan *Grammatophyllum Fenzlianum* can leave but little doubt.

Grammangis Ellisii.

Stems fusiform, four-angled, clothed with closely adherent, pale membraneous sheaths. Leaves 4—7 or more from the upper part of the stem, ligulate, obtuse, 15—25 inches long, 2—2½ inches broad, deciduous. Scapes from the base of the stems, stoutish, arching, racemose, 12—15 flowered; bracts ovate, acuminate, almost as long as the ovaries. Flowers 2—3 inches across the lateral sepals; sepals obovate-oblong with slightly revolute margins and reflexed tip, the dorsal one bent forward, tawny yellow, usually transversely streaked, but sometimes densely spotted with red-brown, always with a broad yellow transverse belt



Grammangis Ellisii.

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* The meaning of the name is obscure; the author has given no explanation.

near the apex; petals much smaller than the sepals, erect with spreading tip, oval-oblong, acute, yellow, sometimes cream colour at the base, light rose-purple at the apex; lip as long as the petals, saccate at the base, three-lobed, the side lobes rotund, erect, straw-yellow or white; the intermediate lobe ovate-triangular, reflexed and yellow at the apex, traversed longitudinally by several white ridges, the furrows between them being reddish crimson; between the side lobes is a narrow, three-ridge white plate that projects in front above the ridges on the intermediate lobe. Column terete, incurved, white, or yellow.

Grammangis Ellisii, Rchb. Xen. Orch. II. p. 17 (1862). Benth. in Journ. Linn. Soc. XVIII. p. 318 and Ridley in XXI. p. 472. *Lindenia, VIII.* t. 338. Grammatophyllum Ellisii, Lindley ex Hook. *Bot. Mag.* t. 5179 (1860). Van Houtte's *Fl. des Serres, XIV.* t. 1488—89 (copied from Bot. Mag.). Rchb. in Gard. Chron. X. (1878), p. 333. Id. XIV. (1880), p. 326 (Dayana). Williams' *Orch. Alb. IV.* t. 147. Godefroy's *Orchidophile,* 1886, p. 352.

This is one of the most distinct of orchids; its flowers, as the accompanying woodcut shows, are of peculiar shape, and in addition they present a most singular and varied combination of colours even for an orchid, and are, morever, very sweet scented. Its discoverer, the Rev. W. Ellis, informed Dr. Lindley that he "found it growing on a branch of a tree about the size of a man's leg, and stretching over a river at about 25 feet above the water. The roots were abundant, but short, white, fleshy and matted together, a little larger than the roots of *Ansellia africana.*" The first introduced plants were cultivated by Mr. Ellis himself, at Hoddesdon, Herts, where one of them flowered for the first time in August, 1859.

Grammangis Ellisii is unfortunately a refractory subject under cultivation, and although frequently imported since its first introduction, its sojourn in the orchid houses of Europe is rarely of long duration.

GRAMMATOPHYLLUM.

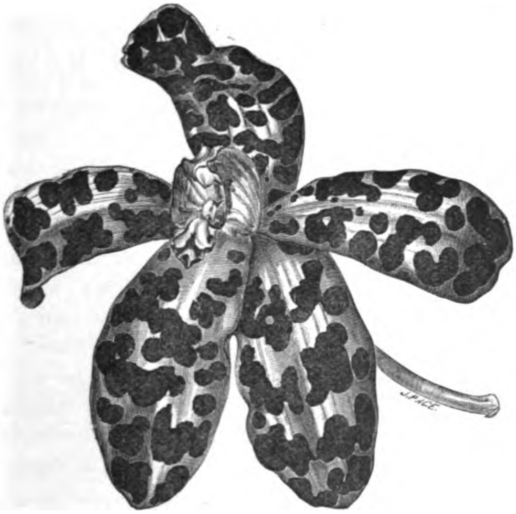
Blume, Bijdr. p. 377, t. 20 (1825). Rchb. Xen. Orch. II. p. 16. Benth. et Hook. Gen. Plant. III. p. 539.

Grammatophyllum includes four or five species dispersed over the Malay peninsula and archipelago. The species are more remarkable for the gigantic dimensions they attain—especially the typical species, *Grammatophyllum speciosum*—than for the attractiveness of their flowers, which are generally of a sombre hue. On account of the amount of space they take up, and the high temperature they require, they are cultivated in but few private collections.

The genus is closely allied to Cymbidium, from which it differs chiefly in the structure of the pollinary apparatus. Its general characters will be gathered from the description of the species that follow. The name is derived from γράμμα, "a mark or character," and φυλλον, "a leaf," in allusion to the markings on the perianth segments, the type species was thence fancifully called the Letter Plant.

Grammatophyllum Fenzlianum.

Stems pseudo-bulbous, clavate-fusiform, slightly compressed, 4—6 inches long and 2—3 inches broad, partially invested with white membraneous sheaths, 3—5phyllous. Leaves narrowly oblong or lanceolate-oblong, 12—18 inches long and 2—2½ inches broad, dark green and leathery. Scapes from the base of the stems, arching, 3—4 feet long, racemed from near the base, many-flowered; bracts small, scale-like. Flowers somewhat distant, 2½ inches in diameter; sepals and petals pale yellow-green spotted with brown, the sepals narrowly elliptic-oblong, the petals oblanceolate, reflexed at the apex and narrower than the sepals; lip shorter than the other segments, three-lobed, the side lobes oblong, erect, yellowish obliquely striped with brown, the intermediate lobe oblong, obtuse, pubescent on the disk, reflexed; between the side lobes is a channelled white plate. Column terete, bent, whitish.



Grammatophyllum Fenzlianum, var. Measuresianum.

Grammatophyllum Fenzlianum, Rchb. Xen. Orch. II. p. 16 (1862).

var.—Measuresianum.

Flowers much larger and more brightly coloured; sepals and petals emerald-green blotched and spotted in various ways with dark brown-purple; side lobes of lip light yellow with oblique brown lines, the front lobe white with three brown lines at the apex.

G. Fenzlianum Measuresianum, supra. G. Measuresianum, Hort. G. Seegerianum, Hort.

Amboyna is given by Reichenbach as the habitat of this species, of which very little appears to be known. A plant, whose origin we are now unable to trace, flowered some years ago in our houses, which Reichenbach identified as his *Grammatophyllum Fenzlianum*, and from this the above description was derived. To this species we have referred with some hesitation the recently introduced *G. Measuresianum*, whose origin has not been divulged, but which is without much doubt eastern Malayan, as we can detect no other differences than those stated above. As a horticultural plant the variety is far superior to the original form, and whether species or variety only, it worthily bears the name of Mr. R. H. Measures, of The Woodlands, Streatham, for many years a most successful cultivator of orchids.

G. multiflorum.

Stems, leaves and inflorescence nearly as in *Grammatophyllum Fenzlianum.* Flowers 1½ inch in diameter; sepals and petals brownish purple with green margins and a green median line, the former subspathulate, obtuse, the latter oblong, keeled behind; lip three-lobed, the side lobes roundish oblong, sub-falcate, erect, light yellow streaked with red-brown; the intermediate lobe oblong with rounded anterior margin, and with four shallow white keels on the disk produced to the base of the lip as a grooved linear-oblong plate. Column clavate, arched, white spotted with brown.

Grammatophyllum multiflorum, Lindl. in *Bot. Reg.* 1838, misc. No. 80, and 1839, t. 65. Paxt. *Mag. Bot. VI.* p. 217. Rchb. Xen. Orch. II. p. 16.

var.—tigrinum.

Flowers with broader and differently-coloured segments; sepals and petals yellow-green heavily blotched with brown-purple; lip light yellow with red-brown markings.

G. multiflorum tigrinum, Lindl. in *Bot. Reg.* 1842, t. 69.

The typical form was discovered by Cuming in the Philippine Islands and plants were sent home by him from Manila in 1837; one of these flowered in Mr. Bateman's collection at Knypersley in

1838, on which occasion the species was figured in the *Botanical Register*, and another in the following year at Baron Dimsdale's, Campfield Place, Herts, which was figured in Paxton's *Magazine of Botany*. Scarcely anything is recorded of its subsequent history. The variety which first appeared shortly after the introduction of the species has much handsomer flowers and is still occasionally seen in cultivation. For materials for description we are indebted to Baron Schroeder, The Dell, Staines.

G. speciosum.

Stems sub-cylindric, compressed, 5—8 or more feet high, and 3 inches in diameter at the thickest, gradually tapering upwards, leafy along the apical third of their length.* Leaves distichous, linear-ligulate, 18—24 inches long, sub-acuminate, sheathing and sharply keeled at the base. "Scape as thick as a man's finger, 5—7 feet long, radical, erect, quite glabrous and many-flowered. Flowers distant, 5—6 inches in diameter, each with a large ovate-lanceolate, concave, greenish bract, an inch long; sepals and petals spreading and undulated, broadly oblong or sub-obovate, yellow spotted and blotched with deep red-purple; lip small for the size of the flower, three-lobed, the lobes obtuse, the side lobes convolute over the column; the disk furrowed with three plates more elevated in the centre, and marked with ciliated red lines; the middle lobe ovate, entire. Column curved, semi-terete, partially spotted with red."†

Grammatophyllum speciosum, Blume, Bijdr. p. 377 (1825). Id. *Rumphia, IV.* p. 47, t. 191. Lindl. Gen. et Sp. Orch. p. 173. Paxt. *Fl. Gard. II.* t. 69. Rchb. Xen. Orch. II. p. 16. *Bot. Mag.* t. 5157. Van Houtte's *Fl. des Serres, XIII.* t. 1386 (copied from Bot. Mag.) Gard. Chron. X. (1878), p. 181, fig. and VII. s. 3 (1890), p. 297. Hook. f. Fl. Brit. Ind. VI. p. 18. Cymbidium scriptum, Sw. Gabertia scripta, Gaud. Epidendrum scriptum, Linn.

This gigantic orchid excited the wonder of travellers in Malaysia long before it found its way into British gardens. The physician Rumphius was probably the first European scientist who became acquainted with it, and through him, or through Osbeck who visited the Malay Archipelago about the middle of the last century, it became known to Linnæus and to his successor Oloff Swartz. Many years afterwards it was detected by Finlayson in Cochin China, and by the French botanist Gaudichaud in the Moluccas, the latter of whom described and figured it in his *Voyages botaniques* under the name of *Gabertia scripta,* a name that cannot be retained as the results of the voyage were not published till after the appearance of Blume's *Bijdragen,* in which the genus Grammatophyllum was founded upon it. But it was not till Blume published a coloured plate of it in *Rumphia,* nearly a quarter of a century later, that the true character of the plant became known, and the surprise of botanists and the longing of horticulturists were awakened. It was introduced by Messrs. Loddiges, and flowered for the first time imperfectly, in their Hackney nursery in 1852. From that time to the present its flowering in the glass-houses of Europe has been a rare occurrence, and the recorded instances are few. In 1859 it flowered in perfection in the collection of Mr. W. G. Farmer at Nonsuch Park, Surrey; many years afterwards we learn from the *Gardeners' Chronicle* that it flowered well in the collection of Sir G. Staunton at Leigh Park, and we believe the late Mr. John Day succeeded in flowering it once, although as in Loddiges' case, very imperfectly.

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* The roots of this plant are developed in a remarkable manner; the primary roots are stoutish and persistent; from these arise a dense plexus of branching secondary roots that spread over the surface of the compost in the pots and beyond the rim; they attain a length of 4—5 inches, with numerous rootlets along the basal half, and die off at the end of the growing season. Paxton observed a similar phenomenon in *Grammatophyllum multiflorum*, and it is probably an essential character of the genus.

† Our description of the plant was taken at Burford Lodge. The inflorescence we have not seen, and we have therefore copied the floral details from the *Botanical Magazine*.

> The following extract from a letter received from Mr. James Herbert Veitch during his Indian travels will convey an idea of the enormous dimensions attained by this gigantic orchid in its native habitat:—"In the Botanic Garden at Penang, a specimen on a rising ground isolated from other plants and surrounded by a shrubbery was carefully measured; the circumference was 42½ feet; the stems are from 6 to 7 feet long, the capsules *with* their stalk are 7½ inches, *without* it 5 inches long. One of the preceding year's racemes, of which there were thirty, was 7½ feet long. The plant is in fine condition, nearly all the stems being clothed with foliage of a good colour."

The geographical range of the species is very extensive. Besides the localities named above: it occurs in Java around Buitenzorg, where Blume's type was gathered; it was found by Parish in Tenasserim, its probable northern limit; by Scortechini in Perak; by Burbidge in Borneo on a prostrate trunk of *Dryobalanops aromatica* (Camphor Tree); and also in the Sulu Islands growing upon a Durian Tree.

POLYSTACHYA.

Hook. Exot. Fl. t. 103 (1825). Benth. et Hook. Gen. Plant. III. p. 540.

Polystachya includes about forty species, chiefly African with a few outlying members in south India, Ceylon and Malaysia, and even sparingly represented in tropical America. The genus, however, possesses so little interest in a horticultural sense that it is only mentioned here for the purpose of bringing under notice the two pretty dwarf species described below.

Polystachya Ottoniana.

Pseudo-bulbs clustered, ovoid, ½ inch long, prolonged at the apex into a slender, compressed stem 1—1½ inch long, from the summit of which are produced two linear, emarginate, grass-like leaves of unequal length, the longer one about 4 inches long, the shorter about half as long. Peduncles slender, issuing from between the leaves and as long as the shorter of the two, one-flowered. Flowers ½ inch in diameter, white, the sepals with a purple median line on the outside, and the lip with a yellow blotch on the disk; dorsal sepal oblong, acute, the lateral sepals ovate, acute, adnate to the foot of the column, and forming with it and the base of the lip a broad *mentum* or chin; lip oval-oblong, obscurely lobed, reflexed at the apex. Column semi-terete; anther purple.

Polystachya Ottoniana, Rchb. in Otto. Hamb. Gartenz. XI. p. 249 (1853). Bonpl. III. p. 217 (1857). Walp. Ann. VI. p. 638 (1863). H. Bolas in Journ. Linn. Soc. XXV. p. 186. P. capensis, Sanderson in Harv. Thes. Cap. II. p. 51, t. 179 (1863).

A very attractive little orchid when massed and in full bloom. It was introduced into German gardens in 1847 from South Africa, where it is plentiful in places in the eastern provinces from Uitenhage to Natal. Materials for description were sent to us from Burford Lodge. The species is named in compliment to Herr Otto, Director of the Botanic Garden at Hamburgh at the time of its introduction.

P. pubescens.

Pseudo-bulbs crowded, about the size of a small filbert, elongated, di-triphyllous. Leaves oblong-lanceolate, 3—4 inches long, the first or lowermost leaf where there are three, much smaller than the upper two between which the erect peduncle arises. Peduncles longer than the leaves, flattened below with sub-acute edges, pubescent; racemose above, 12—20 flowered; bracts triangular, acute. Flowers inverted, bright yellow, the lip and inferior half of the sepals streaked with red; sepals ovate, acute; petals somewhat smaller, obovate-oblong, obtuse; lip smaller than the other segments, three-lobed, the side lobes roundish oblong, pubescent on the inner side, the intermediate lobe ovate, reflexed at the tip. Column very short, clavate.

Polystachya pubescens, Rchb. in Walp. Ann. VI. p. 643 (1863). *Bot. Mag.* t. 5586. *Lindenia, IV.* t. 170. H. Bolas in Journ. Linn. Soc. XXV. p. 186. P. Lindleyana, Sand. in Harv. Thes. Cap. II. p. 50. t. 178. Epiphora pubescens, Lindl. in Comp. Bot. Mag. No. 19, p. 201; and Bot. Reg. 1840, misc. No. 103.

This is the prettiest of the Polystachyas known to us, and one that has recently become much distributed among the orchid collections of this country. It was originally discovered by Burchell, in Kaffraria, and afterwards collected by Drége, for Messrs. Loddiges, in whose nursery it flowered in 1840. It has since been gathered in several localities in south-east Africa from Uitenhage to Delagoa Bay.

SUB-TRIBE CYRTOPODIEÆ.

Terrestrial or epiphyte with leafy stems that are often pseudo-bulbous. Leaves plicate or with prominent veins. Scapes produced from the base of the stems or pseudo-bulbs, racemose or paniculate. Column more or less produced into a foot. *

CYRTOPODIUM.

R. Br. in Ait. Hort. Kew. ed. 2, vol. V. p. 216 (1813). Benth. et Hook. Gen. Plant. III. p. 541.

With Cyrtopodium Mr. Bentham joined the Cyrtopera of Lindley, on the ground that the geographical distinction between them can no longer be maintained. Unfortunately this view cannot be accepted, as the true Cyrtopods are exclusively American, and the Asiatic species of Cyrtopera have a nearer affinity with Eulophia. The only species of Cyrtopodium known to us to be in cultivation are *C. Andersonii* and *C. punctatum.* They are well distinguished by their long fleshy stems and tall branching inflorescence with numerous showy flowers that are produced continuously for several weeks in succession.

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* This sub-tribe includes twenty-one genera "whose general character is to have the prominent mentum of MAXILLARIEÆ with the foliage and habit of CYMBIDIEÆ, thus forming a connecting link between those two sub-tribes, but with limits not always quite so definite as could be wished, for there are here and there species offering exceptions to one or other of the characters."—G. Bentham in Journ. Linn. Soc. XVIII. p. 319.

The generic name is derived from κύρτος, "curved," and πούς πόδος, "a foot," in reference to the curved foot of the column.

Cultural Note.—The compost recommended for Cyrtopodiums is a mixture of fibrous loam and some rough peat, to which some cultivators add a little well-rotted cow-manure; this should be placed on an ample drainage of broken crocks. As they are heat-loving plants they should be placed in the highest temperature available while in active growth, but they may be removed into an intermediate temperature when the season's growth is matured. Owing to their robust habit the supply of water must be copious and constant during the growing season.

Cyrtopodium Andersonii.

Stems fusiform or sub-cylindric, more or less curved, 2—3 feet long and 1½ inch thick, sheathed at the joints by the persistent bases of the fallen leaves. Leaves lanceolate, sub-acuminate with about three prominent nerves, 15—24 inches long. Scapes stoutish, erect, 3—5 feet high, terete, pale fulvous green; cauline bracts ovate, acuminate, sub-ventricose, 1—1½ inch long; floral bracts similar, but smaller and more open. Panicle many-flowered; flowers about 2 inches in diameter; sepals and petals broadly ovate, obtuse, apiculate; petals a little broader and longer, obovate, obscurely keeled behind, both sepals and petals chrome-yellow, sometimes more or less tinted with green towards the apex; lip three-lobed, of a deeper and brighter yellow than the other segments, the side lobes obovate, erect, the intermediate lobe broader, sub-quadrate, concave, the central area regularly furrowed, the marginal area rugose; between the side lobes is a raised plate densely spotted with red. Column short, triquetral, yellow-green sometimes stained with brown.

Cyrtopodium Andersonii, R. Br. in Ait. Hort. Kew. ed. 2, vol. V. p. 216 (1813). *Bot. Mag.* t. 1800 (1816). *Bot. Reg.* 1841, t. 8. Lindl. Gen. et Sp. Orch. p. 188. Rchb. in Walp. Ann. VI. p. 667. Cymbidium Andersonii, Bot. Repository, t. 651. C. cardiochilum, Lindl. in Journ. Hort. Soc. IV. p. 266 (1849). Williams' *Orch. Alb. IV.* t. 176.

The species on which the genus was founded, and one of the first tropical orchids cultivated in this country. It was originally sent to Mr. Thomas Evans—a liberal patron of horticulture in the early part of the present century—from the island of St. Vincent, in the West Indies, by Mr. Alexander Anderson, after whom it is named. It is also found in other parts of the West Indies and on the neighbouring mainland. Dr. Lindley states that from the fleshy stems the shoemakers obtain a kind of paste or glue which they use for the purposes of their art.* *Cyrtopodium Andersonii* is occasionally seen in orchid collections under the name of *C. cardiochilum,* which cannot, however, be botanically separated nor, in our opinion, horticulturally distinguished from the type.

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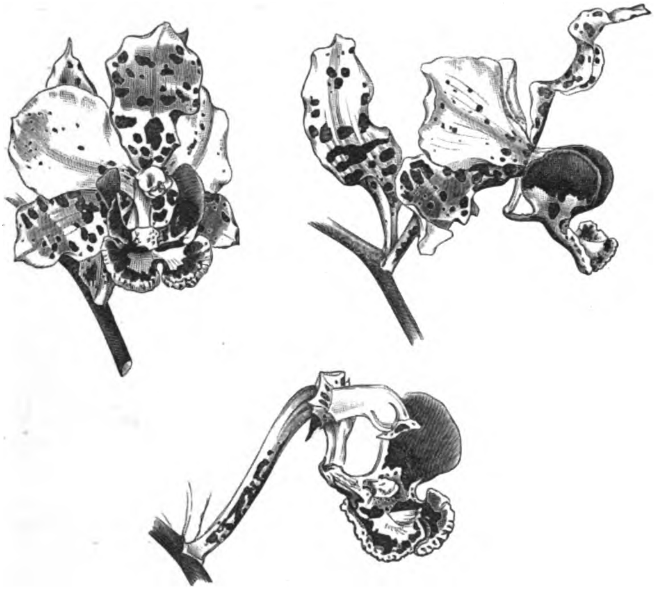
* Bot. Reg. sub. t. 8. The application of any part of an orchid plant to any economic use is so rare that the circumstance is here expressly noticed.

C. punctatum.

Stems, leaves and inflorescence as in *Cyrtopodium Andersonii,* except that the leaves are much more acuminate. Cauline bracts spathaceous, broadly oval, 5—6 inches long, yellowish green stained and blotched with reddish brown chiefly on the basal half; floral bracts much smaller, oblong-lanceolate, 1½ inch long, and brightly coloured like the sepals. Flowers 2 inches in diameter; sepals and petals oval-oblong, undulate, the former bright tawny-yellow barred and spotted with cinnamon-brown, the latter bright tawny-yellow with few, often without spots; lip much shorter than the other segments, three-lobed, the side lobes oblong-spathulate, curved inwards, brick-red; the intermediate lobe semi-lunate with crisped margin, yellow bordered with red; crest a much tuberculated oblong plate, white dotted with red. Column semi-terete, bent, yellow-green.



Cyrtopodium punctatum.

Cyrtopodium punctatum, Lindl. Gen. et Sp. Orch. p. 188 (1832). Id. *Sert. Orch.* t. 12. *Bot. Mag.* t. 3507. Rchb. in Walp. Ann. VI. p. 666. Van Houtte's *Fl. des Serres, XXII.* t. 2352. Godefroy's *Orchidophile,* 1885, p. 270. Williams' *Orch. Alb. V.* p. 202. *Lindenia, VIII.* t. 344. C. Saintlegerianum, Rchb. in Gard. Chron. XXIII. (1885), p. 756, and IV. s. 3 (1888), p. 180, with fig. Epidendrum punctatum, Linn. Sp. Pl. ed. II. p. 1349.

In this very handsome Cyrtopodium we have a remarkable instance of constancy in character over a geographical range which is equalled in extent by that of few other species of orchids, for its limits in tropical America, both northern and southern, almost coincide with the limits of epiphytal orchid life on that continent. It was originally discovered in Cuba in the last century by Plumier, through whose specimens it became known to Linnæus. In the early part of the present century it was gathered by Mackenzie in St. Domingo; by Deppe and Schiede in Mexico; in northern Brazil by Martius, and in southern Brazil by Gardner. But long before it was gathered by Gardner it was found by Swainson, the introducer of *Cattleya labiata*, who sent it to the Botanic Garden at Glasgow, where it was cultivated many years before it could be induced to flower, a circumstance by no means surprising or unusual under the treatment to which orchids were at that period subjected. At length in 1835 its first panicle of flowers expanded, on which occasion it was figured in the *Botanical Magazine*, and a little later the species was again figured in Lindley's superb *Sertum Orchidaceum*. The latest phase in its history was to some extent a surprise; this was its discovery in northern Paraguay in 1878 by M. de Saint Leger, and its subsequent importation from that region. Although the Paraguayan plant received separate specific rank from Reichenbach, it conforms strictly to the common type and must bear the same name.

ZYGOPETALUM.

Hook. in Bot. Mag. t. 2748 (1827). Rchb. in Walp. Ann. VI. p. 650 (1863). Benth. et Hook. Gen. Plant. III. p. 542 (1883).

The limits of a genus are often difficult to define; the difficulty may arise from various causes, and none more so than the progress of discovery. A species may appear in cultivation that was previously unknown to science, and the botanist who deals with it, finding characters in the flowers structurally different from every known genus, creates a new one for its reception. Another species may afterwards come to light having some structural analogy to the former, but at the same time differing from it in some apparently essential character that forbids its being referred to the genus founded upon the former species, or to any other, and in consequence another genus is proposed for its reception. The process may be repeated for a third and even for a fourth species, and so on. This is precisely what has happened with species now included in the genus under review.

About the year 1826 Mr. Mackay, of the Trinity College Botanic Garden, Dublin, introduced from Brazil a beautiful and now well-known orchid which, on flowering, he submitted to Sir William Hooker, who found it so unlike any described species in the structure of its flowers that he had no hesitation in founding upon it the genus Zygopetalum. Some years later another orchid was discovered in British Guiana by Schomburgk, and a specimen was sent by him to Mr. Bateman, who named it *Huntleya sessiliflora*,* but did not publish a diagnosis of his new genus. Lindley subsequently referred other species to Bateman's Huntleya, including *H. Meleagris*, which was the first that was figured and described, and is thence the type species of that group, and *H. violacea* figured in his *Sertum Orchidaceum*. But as these two species differ somewhat from each other in the characters of the labellum and column, Reichenbach removed them from Huntleya, referring the first to Lindley's Batemania,† and founding upon the second his own genus Bollea.

Then followed the discoveries of Warscewicz in Central America, some of which were constituted a new genus by Reichenbach under the name of Pescatorea, and others under the name of Warscewiczella; and besides these Lindley referred other species to Warrea which diverge from the type species of that genus far more than they do from that of Zygopetalum. Thus a series of genera were founded, all bearing an evident relation to each other, but which on first examination seemed to be sufficiently distinct from each other to require a separate generic nomenclature. As new species came to light from that apparently inexhaustible treasury of orchid life, the tropical region of Central and South America, the original lines of demarcation were much obliterated, and Zygopetalum, Huntleya, Bollea, Warscewiczella, Pescatorea, Warrea (in part) and Batemania (in part) became a confused group of genera, the limits of each of which could not be clearly determined. So long ago as 1863 this unsatisfactory classification became so evident that Reichenbach, when compiling his synopsis of the ORCHIDEÆ for Walper's *Annales Botanices*, merged nearly all of them into Zygopetalum, including also his own genus Kefersteinia and Lindley's Promenæa. The propriety of this course was strengthened by subsequent discoveries, so that when Mr. Bentham undertook the revision of the ORCHIDEÆ for the *Genera Plantarum* he unhesitatingly adopted it, adding Batemania except the type species, and restoring *Zygopetalum rostratum* (Hook.) and another species which Reichenbach had separated under the name of Zygosepalum. The genus Zygopetalum thus enlarged may still seem to many horticulturists to be made up of heterogeneous elements that ought to be kept distinct, at least for garden use, but after full consideration we are satisfied that the course adopted by Mr. Bentham is that which should be accepted, especially as every fresh discovery tends to confirm it.

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* It is quite uncertain what this plant is; by some it is supposed to be *Huntleya violacea* (Lindl.).

† Lindley's type species is still retained under Batemania. *See* infra.

The genus is confessedly a polymorphous one, but the following characters fairly circumscribe it:—

The *sepals* are sub-equal and spreading, either free or joined at the very base; the lateral two are adnate to the short foot of the column.

The *petals* are similar and nearly equal to the sepals.

The *lip* is affixed to the foot of the column, forming with it a short, obtuse *mentum* or chin; the lateral lobes are usually small and erect, sometimes embracing the column, the blade large and spreading. The transverse crest is very prominent and fleshy, either entire or lobed, rarely fimbriated.

The *column* is incurved, semi-terete, wingless, or shortly winged at the apex. The anther is two-celled, the pollinia four, sessile on the gland or viscid disk that rests on the rostellum

From the above diagnosis it is evident that the prominent fleshy crest, which is often furrowed, rarely fringed, and nearly always more deeply or differently coloured than the other parts of the flower, is the chief distinguishing character of the genus.

In their vegetation the Zygopetala, even in the enlarged sense in which the genus is here understood, are remarkably uniform, the most obvious variations being the presence or absence of pseudo-bulbs; the one, two or many-flowered scapes, and the smaller size of the species hitherto known as Promenæas and Kefersteinias.

The number of species known to science is upwards of fifty. These are spread over the South American continent from the cooler parts of southern Brazil to the isthmus of Panama; and also over Central America, southern Mexico, and the West Indies.

The following sectional divisions are proposed by Mr. Bentham, of which we give the most obvious characters:—

I. EUZYGOPETALUM. Scapes many-flowered; the labellum broad with its crest thick, entire or lobed. This includes the type species *Z. Mackayi*, also *Z. Burkei*, *Z. maxillare*, *Z. graminifolium*, and others.

II. ZYGOSEPALUM. Scapes few-flowered, sepals and petals narrowly acuminated. *Z. rostratum* and *Z. Kegelii*, the latter not known in cultivation.

III. HUNTLEYA. Scapes one-flowered; the labellum clawed and its crest distinctly fimbriated; the column broad and crenulate at the apex. *Z. Meleagris*, *Z. Burtii.*

IV. BOLLEA. Scapes one-flowered; sepals and petals broad; the labellum shortly clawed, the crest thick and elevated; the column broad and arching. *Z. cæleste*, *Z. Lalindei.*

V. WARCEWICZELLA. Scapes one-flowered; sepals and petals nearly as in Euzygopetalum, but sometimes undulated; the labellum often very broad. *Z. cerinum*, *Z. cochleare*, *Z. Dayanum*, *Z. discolor*, *Z. Klabochorum*, *Z. lamellosum*, *Z. Lehmanni*, *Z. marginatum*, etc.

VI PROMENÆA. Scapes as in Warscewiczella, but the plants of much smaller size; the column often but not always with raised longitudinal lines on the face below the stigma. *Z. gramineum*, *Z. stapelioides*, *Z. xanthinum.*

Cultural Note.—The species included in the section EUZYGOPETALUM present no difficulty in respect of their cultivation; in fact, the type species, *Zygopetalum Mackayi* and its varieties are among the easiest of orchids to grow satisfactorily. For these, pots corresponding to the size of the plants should be selected, in which a drainage of clean broken crocks should be placed to about two-thirds of the depth, and over these a layer of moss to keep the drainage free from the soil above. The compost should consist of one-half fibrous peat and one-half fresh sphagnum, with a sprinkling of silver sand; the potting should be repeated annually when the plants begin to produce new roots. *Z. maxillare* and *Z. graminifolium*, which have creeping rhizomes, and in their native country affix themselves to the stems of tree ferns, should be either attached to pieces of tree-fern stems or to blocks of wood, but they may also be grown in pots. All these species come from the same region as *Cattleya Loddigesii*, *C. intermedia*, *Lælia purpurata*, *L. elegans*, etc.; their cultural treatment as regards temperature, ventilation, shading, etc., is essentially the same as for that group of orchids. It is given in detail under Cattleya, but it may be useful here to remind cultivators that the winter or resting season temperature should range from 15°—18° C. (60°—65° F.) in the day and about 3° C. (5° F) lower in the night, and the summer or growing season temperature should range from 18°—21° C. (65°—70° F.) in the day and about 3° C. (5° F.) lower in the night. The supply of water must be constant during the growing season, as *Z. Mackayi* roots very freely in the compost, and *Z. maxillare* when on a block has its roots exposed. *Z. rostratum* requires more heat than the Brazilian species, and should have a shady position in the East Indian house. Generally speaking, the Zygopetalums require more shade than the Cattleyas and Lælias.

The species included in the section PROMENÆA are also of easy culture. Being of small size, teak baskets or shallow pans that can be suspended near the glass should be preferred. They may be treated like the smaller Odontoglots, as *Od. Rossii* and *Od. Cervantesii* during the summer months, but they should be removed to the intermediate house for the remainder of the year.

The disappointing experience of the past twenty years in the cultivation of the species now comprising the sections HUNTLEYA, BOLLEA and WARSCEWICZELLA forbids the formulating of any course of treatment for them. Doubtless several causes have combined to bring about the failure to establish this fine group of orchids in the glass-houses of Europe, but none more so than the withholding of reliable information respecting their geographical station and their environment *in situ*. All attempts to cultivate them hitherto have been purely empiricisms, and even if the climatic and other conditions cannot be approximately imitated artificially, yet it must evidently be in the interests of importers and collectors to impart such information they possess as may tend in any degree to assist the cultivator.

SYNOPSIS OF SPECIES AND VARIETIES.

Zygopetalum brachypetalum.

Pseudo-bulbs ovate-oblong, compressed, 2—2½ inches long, ribbed and furrowed on the flattened sides, di-triphyllous. Leaves linear-ligulate or narrowly lanceolate, sub-acuminate, conduplicate at base, 15—20 or more inches long. Scapes as long as the leaves, loosely racemed, 7—10 flowered; bracts foliaceous, ovate, acute, slightly inflated, about an inch long. Flowers 2½ inches across vertically; sepals and petals uniform, narrowly oblong, acute with margins more or less revolute, brown tinged with green towards the base; lip broadly clawed, expanding into a sub-orbicular emarginate blade, light mauve, almost white at the margin, and veined with bright mauve-blue; crest horse-shoe shaped, ridged and furrowed, white with a few blue lines. Column short, semi-terete, white stained with brown and green.

Zygopetalum brachypetalum, Lindl. ex Rchb. in Walp. Ann. VI. p. 660.* Journ. Hort. Soc. IV. (1849), p. 12, with fig.

A very handsome species flowering in mid-winter. It was exhibited by M. de Jonghe, of Brussels, at a meeting of the Horticultural Society of London on December 5th, 1848, when it received an award. In the report of the meeting published in the Society's Journal (*loc. cit. supra*) it is stated that this species was originally brought into notice by Mr. Waterhouse, of Halifax, in the year 1840 and is little known. M. de Jonghe informed Dr. Lindley that it was found by his collector Libon in 1847 on the peak of Itabira in the province of Minas Geraes in Brazil. It is very near *Zygopetalum Mackayi,* differing from it chiefly in its much longer and narrower leaves; in its smaller and less fleshy flowers that are differently coloured; in its differently-shaped lip and narrower crest that is not excavated in front. We are indebted to Sir Trevor Lawrence, Bart., for materials for description.

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* Bot. Reg. XXX. (1844), misc. 5 is quoted by Reichenbach but we do not find it there.

Z. Burkei.

Pseudo-bulbs sub-tetragonal, compressed, 2—4 inches long, di-triphyllous. Leaves linear-oblanceolate, acute, conduplicate at base, 9—12 inches long. Scapes stoutish, erect, longer than the leaves, about five-flowered; bracts cymbiform, about half as long as the pedicel and ovary. Flowers 2½ inches in diameter; sepals and petals similar and sub-equal, oval-oblong with reflexed margins, the lateral sepals more acute than the dorsal one, green, with 7—9 chocolate longitudinal lines which are sometimes broken up into dots and become more or less diffused towards the apex of the segments; lip broadly clawed with a small auricle on each side of the crest, and expanding into a sub-orbicular, undulate, milk-white blade, irregularly dentate at the margin; crest fleshy, semi-circular in front, with about thirteen violet-purple ribs. Column very thick, terete, pale yellow with some purple streaks above, streaked longitudinally with purple below the stigma; the apical wings very narrow and toothed.

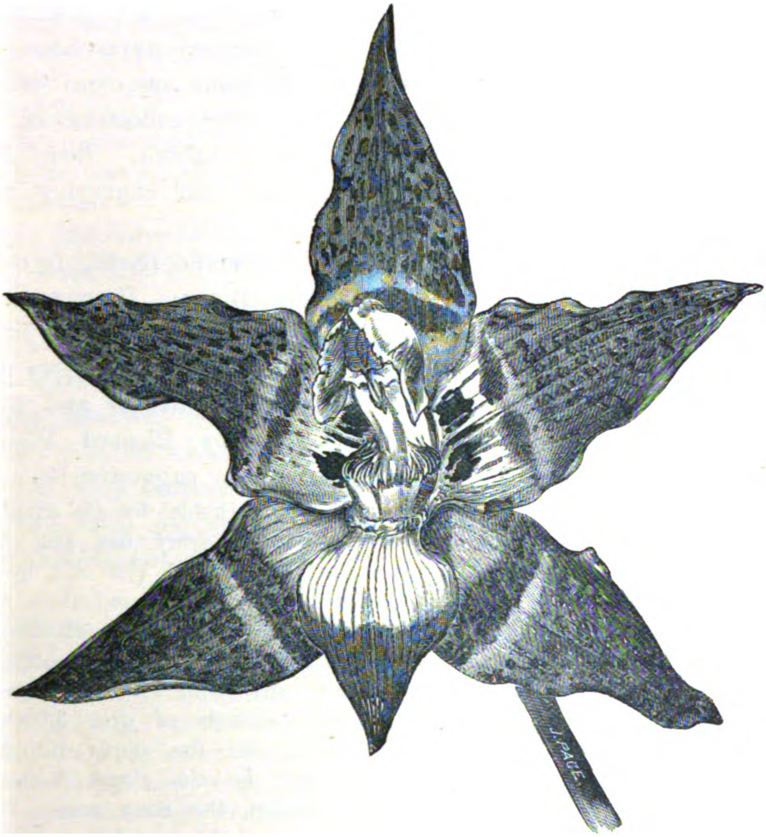
Zygopetalum Burkei, Rchb. in Gard. Chron. XX. (1883), p. 684. Williams' *Orch. Alb.* t. 142.

A very handsome species belonging to the section EUZYGOPETALUM of Bentham, introduced by us in 1881 from the Roraima in British Guiana through our collector, David Burke, after whom it is named, and who found it growing on rocks at about 6,000 feet elevation in the swamps in which *Cypripedium Lindleyanum* and *Heliamphora nutans* have their home; it is still very rare in European collections. The contrast between the pure white blade of the labellum and the green sepals and petals formally streaked with red-brown is very striking.

Z. Burtii.

Pseudo-bulbs none. Leaves radical, narrowly elliptic-oblong, acute, 10—15 inches long. Peduncles stoutish with a sheathing, acute, greenish bract at each joint, one-flowered. Flowers 3—4 inches in diameter, all the segments more or less fleshy; sepals and petals sub-equal, ovate-oblong, acute, white at the very base, then yellow, the apical half red-brown with some yellow spots, the petals with some crimson-purple streaks at the base; lip clawed, narrowly elliptic-oblong, acute, reflexed, the basal half white, the apical half red-brown; crest a semi-circular white plate fringed with long, narrow, light-purple, incurved teeth. Column triquetral, winged and hooded with the margin jagged, pale green with a purple spot on each side of the stigma.

Zygopetalum Burtii, Benth. in Gen. Plant. III. p. 543 (1883). Batemania Burtii, Rchb. in Gard. Chron. 1872, p. 1099. *Bot. Mag.* t. 6003. *Fl. Mag.* N.S. t. 101. Regel's *Gartenfl.* 1883, t. 1114.



Zygopetalum Burtii.

From the *Gardening World*.)

var.—Wallisii.

Flowers larger with all the segments narrower and more acuminated; sepals chestnut-brown, white at the very base; petals chestnut-brown, yellow at the base with a brown-purple blotch broken into lines; lip darker than the other segments, the crest whitish and the fimbriæ red-brown.

Z. Burtii Wallisii, supra. Batemania Burtii Wallisii, Roezl in Godefroy's Orchidophile, 1883, p. 477. Batemania Wallisii major, Williams' *Orch. Alb. IV.* t. 185.

Originally discovered by Endres in 1867 in Costa Rica, and shortly afterwards imported by us from that country; it flowered for the first time in Great Britain in the collection of the late Mr. Burnley Hume, at Winterton, in Norfolk, in the summer of 1872. The comparatively few plants that have flowered since show that the species is variable in the size and colour of the flowers, but no structural deviations from the first described type have been observed by us. The variety, a very handsome one, was detected by Wallis, and afterwards by Roezl and other collectors in New Granada, none of whom divulged its precise habitat. Roezl states that a similar variety is found in Ecuador.* Our engraving represents a Colombian form.

Zygopetalum Burtii, better known as *Batemania Burtii,* is one of a group of orchids forming the sections BOLLEA, HUNTLEYA, and WARSCEWICZELLA as defined above, that have hitherto proved difficult to cultivate. The following account of the climate of Costa Rica, the native country of *Z. Burtii, Z. cerinum, Z. discolor* and others, communicated to the *Gardeners' Chronicle*† by Richard Pfau, an orchid collector in Central America, may prove suggestive:—

> "The temperature of Costa Rica is remarkable for its equability, especially for the minima which are reached every day just before sunrise. At my station the maximum was 26° C. (79° F.) by day, and never below 15° C. (60° F.) by night. In the mountain region the temperature is about 2° C. less for every 1,000 feet of elevation. The temperature is about the same all through the rainy season, and even in the dry season the difference is only about 1° C. The greatest heat observed in the dry season at an altitude of over 3,000 feet was 30° C. (86° F.) in March, 1881. On the slopes facing the Atlantic it rains every day in the year; on the slopes facing the Pacific there is a dry and a rainy season, the rainy season lasting from May till November, the remaining part of the year being absolutely dry. During the rainy season the atmosphere is saturated with moisture. At other times the north wind dries up everything, but the nights are nevertheless very damp; the dew is exceedingly heavy at all times of the year."

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* Godefroy's Orchidophile, loc. cit.

† Vol. XX. (1883), p. 599.

"Pescatoreas, Bolleas and Warscewiczellas grow in the dark shadows of the virgin forest on stones or on the stems and lower branches of trees; these require shade, too much light would kill them."

Z. candidum.

Pseudo-bulbs none. Leaves radical, ligulate-cuneate or oblanceolate, acute, reflexed at the tips, pale green. Scapes whitish, slender, much shorter than the leaves, one-flowered; bracts ½ inch long, sheathing, membraneous, pale brown. Flowers 2 inches in diameter; sepals and petals lanceolate, acute, white; the dorsal sepal bent forwards, the petals and lateral sepals more or less reflexed; lip obscurely three-lobed, the side lobes obliquely oblong, incurved towards the column, white with the front margin light violet; the intermediate lobe sub-orbicular with a striated violet blotch on the disk, the marginal area light violet striated with white; crest a thin transversely oblong plate toothed along the front margin. Column white, triquetral, dilated at the apex.

Zygopetalum candidum, Rchb. in Walp. Ann. VI. p. 656 (1863). Warrea candida, Lindl. in Paxt. Fl. Gard. I. p. 32, icon. xyl. (1851). Warscewiczella candida, Rchb. in Bot. Zeit. 1852, p. 36. Linden's *Pesc*, t. 15. Huntleya candida, Hort.

A handsome but rare species in European gardens somewhat more tractable under cultivation than many of its congeners, introduced from Bahia in Brazil in 1848 by M. Morel, of Paris; its habitat, however, is said to be in the interior of the province, several hundred miles from the coast. It has been occasionally imported with *Cattleya Aclandiæ*, *Lælia grandis*, and other orchids from the same region; it thence requires the same temperature as those orchids but more shade.

Z. cerinum.

Leaves four to six to each growth, the lower ones short, the upper ones oblong-ligulate, acute, 7—10 or more inches long. Peduncles 3—4 inches long, one-flowered, sheathed by 2—3 lanceolate, acute bracts. Flowers 3 inches in diameter; sepals and petals light citron-yellow, the dorsal sepal and petals similar and sub-equal, obovate, obtuse, concave towards the apex; the lateral sepals broader, oval-oblong, sub-acute; lip clawed, bright yellow, oval-oblong, convex with the lateral margins reflexed and the upper surface covered with warty excrescences; crest semi-circular, regularly ridged and furrowed, the ridges red-brown. Column terete, light yellow below the stigma; anther red-purple.

Zygopetalum cerinum, Rchb. in Walp. Ann. VI. p. 651 (1863). Id. in Van Houtte's *Fl. des Serres*, *XVII.* t. 1815. Huntleya cerina, Lindl. in Paxt. Fl. Gard. III. p. 62, icon. xyl. (1853). *Bot. Mag.* t. 5598. Pescatorea cerina, Rchb. *Xen. Orch. I.* p. 184, t. 65. *Fl. Mag.* N.S. t. 93. Williams' *Orch. Alb. IX.* t. 394.

One of the discoveries of Warscewicz in 1849—50 on the volcano of Chiriqui in Veragua at 8,000 feet elevation it is said, but this is probably excessive, as one of our own collectors reported it at 2,000—3,000 feet growing under climatic conditions similar to those described under *Zygopetalum Burtii.* It was first cultivated in this country by the late Mr. Sigismund Rucker, at West Hill, Wandsworth, who appears to have been the sole possessor of the species till imported by us in 1865. Occasional importations since that date have caused it to be one of the best known and most generally cultivated species of its section.

Z. cochleare.

Pseudo-bulbs none. Leaves broadly oblanceolate, 7—12 inches long, cuneate below into a broad channelled foot-stalk. Peduncles shorter than the leaves, sheathed at the base by an oblong acute bract, and by a similar smaller one at the base of the ovary, one-flowered. Flowers delightfully fragrant, 2½ inches in diameter; sepals and petals of wax-like texture, French-white, the dorsal sepal and petals narrowly oblong, acute; the lateral sepals broader, ovate, oblong, greenish yellow at the apex; lip sub-quadrate, concave towards the base, slightly reflexed at the apex, white with broad, close-set, violet-purple longitudinal lines; crest semi-lunate, frilled. Column semi-terete, clavate, French-white stained with violet-purple below the stigma.

Zygopetalum cochleare, Lindl. in *Bot. Reg.* 1836, t. 1857, and 1844, misc. No. 15. *Bot. Mag.* t. 3585. Z. flabelliforme, Rchb. in Walp. Ann. VI. p. 652 (1863). Z. Gibbeziæ, *Lindenia, IV.* t. 181. Warscewiczella cochlearis, Rchb. in Bot. Zeit. 1852. p. 714. Huntleya imbricata, Hort.

Discovered by Descourtilz in the early part of the present century on the high mountains separating the provinces of São Paulo and Minas Geraes, in southern Brazil, and first introduced in 1835—6 by our predecessor, Mr. Knight. Its pleasant fragrance is its chief recommendation. We are indebted to Sir Trevor Lawrence, Bart., for materials for description.

Z. cœleste.

Pseudo-bulbs none. Leaves 6—10 to each growth, oblong-lanceolate, acuminate, 6—12 inches long, 1½—2 inches broad. Peduncles stoutish, sub-erect or nodding, shorter than the leaves, with a small sheathing bract at each joint, one-flowered. Flowers 3—4 inches in diameter, the sepals and petals bluish violet, paler at the margin and base, yellowish at the tips; the dorsal sepal broadly obovate and bent forwards, the lateral two oval-oblong; the petals like the dorsal sepal, but more spreading; lip shorter than the other segments, with a larger buff-yellow semi-circular crest occupying three-fourths of the area of the entire lip, deeply grooved longitudinally into numerous rounded ridges; the small ovate blade with recurved margin and tip, and coloured like the sepals and petals. Column broad, arching, convex and bluish violet above, concave and yellow in front, hairy and spotted with red towards the base.

Zygopetalum cœleste, Rchb. in Gard. Chron. V. (1876) p. 756. Bollea cœlestis, Rchb. in Gard. Chron. VII. (1877), p. 366. *Bot. Mag.* t. 6458. Regel's *Gartenfl.* 1882, t. 1075. Godefroy's Orchidophile, 1882, p. 42. Paxt. *Fl. Gard.* re-issue, I. pl. 15. B. pulvinaris, Rchb. *Lindenia, II.* t. 61.

A most remarkable orchid on account of the unusual but very handsome colour, as well as the large size of its flowers. Its history was very imperfectly known till M. Roezl communicated to Godefroy's *Orchidophile*, in 1883, the following particulars of its habitat:—

"On the route from Beneventura to Calli over the western Cordillera of Colombia, at about 6,000 feet elevation, extend impenetrable forests on the left side; the place is called Salado. Some years ago I sent my nephew, Edward Klaboch, for *Masdevallia Chimæra*, which occurs in great quantity and in great variety in this locality. He discovered some tufts of a Pescatorea growing on a tree about a yard from the ground. A Pescatorea at 6,000 feet elevation seemed to me to be somewhat strange, and when visiting the same district in the following year I found that it was *Bollea cœlestis*.

The locality where this plant grows is rather cold during the night; the thermometer sinks to 8°—10° C. (46°—50° F.), and sometimes even lower; during the day it rises to 15°—20° C. (60°—72° F.). This difference between the day and night temperature causes a copious condensation of moisture, and even when it does not rain the plant is constantly damp. Its stout roots penetrate or creep under the rotten leaves of the different trees. Tufts 20—30 inches in diameter occur frequently with 30—40 flowers open at one time."*

These particulars should afford a clue to the habitat of the plant, and suggest its cultural treatment if re-discovered. It was introduced in 1876 by Messrs. Backhouse, of York, but it is now become very rare in British collections, if it has not entirely disappeared.

Z. Dayanum.

Pseudo-bulbs none. Leaves in tufts of 6—8, oblanceolate-oblong, acute, equitant at base, 10—15 inches long. Peduncles 3—4 inches long, one-flowered, with a small green sheathing bract below the middle and a larger brownish one at the base of the ovary. Flowers 3 inches across the lateral sepals; sepals and petals fleshy, cream-white tipped with pale green; the sepals oblong-obtuse, concave; the petals about one-third smaller, obovate, obtuse; lip with a short claw and convex sub-orbicular blade, white stained with crimson; crest semi-circular, plaited, deep crimson. Column short and broad, white above, yellow below the stigma; anther crimson.

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* Godefroy's Orchidophile, 1883, p. 507.

Zygopetalum Dayanum, Benth. in Gen. Plant. III. p. 543 (1883). Pescatorea Dayana, Rchb. in Gard. Chron. (1873), p. 575; and II. (1874), p. 226. *Bot. Mag.* t. 6214 (rhodacra).

sub-vars.—*candidula* (Gard. Chron. III. (1875), p. 342, with fig.), sepals and petals pure white; *rhodacra* (Bot. Mag. loc. cit.), sepals and petals with bright red tip; *splendens* (Gard. Chron. (1873), p. 575), sepals and petals with violet blotches at the apex.

Discovered by Gustav Wallis in New Granada and introduced by us in 1873. On flowering in the several collections among which the plants were distributed, either the markings of the perianth were found to be variable or altogether absent as in the sub-varieties noted above. The precise habitat of the species which has hitherto been known in gardens as *Pescatorea Dayana* was not intimated to us by the collector. The species commemorates the late Mr. John Day, of Tottenham.

Z. discolor.

Leaves in tufts of 5—7, oblanceolate, sharply acuminate, conduplicate at base, 6—12 inches long. Peduncles shorter than the leaves, one-flowered; bracts sheathing, membraneous, brown. Flowers 2 inches in diameter; sepals spreading, ivory-white; the dorsal one elliptic-oblong, acute; the lateral two longer and narrower, oblong-lanceolate; the petals oval-oblong, obtuse, white tinted with light violet on the apical half; lip violet-purple with paler margin, three-lobed, broadly obovate in outline, the side lobes narrow and turned inwards; the intermediate lobe spreading, slightly concave; crest semi-circular, broken up into digitate segments. Column short, clavate, white.

Zygopetalum discolor, Rchb. in Walp. Ann. VI. p. 655 (1863). Warrea discolor, Lindl. in Journ. Hort. Soc. IV. p. 265 (1849). Id. in Paxt. Fl. Gard. I. p. 73. *Bot. Mag*, t. 4830. Warscewiczella discolor, Rchb. in Bot. Zeit. 1852, p. 636. Id. *Xen. Orch. I.* p. 221. t. 93.

Discovered by Warscewicz in 1848 on the volcano of Carthago in Costa Rica, growing on Erythrina trees at 4,000—9,000 feet elevation. The few plants introduced by the discoverer were sold at Stevens' Rooms, one of which acquired by the late Mr. R. S. Holford flowered in his collection at Westonbirt, in Gloucestershire, in 1849, on which occasion the species was described by Lindley in the Journal of the Horticultural Society under the name of *Warrea discolor.* It was subsequently gathered by Oersted in the same country; and in 1857 Wendland collected it between Naranjo and Carthago. It was shortly afterwards figured by Reichenbach in his *Xenia Orchidacea* as *Warscewiczella discolor,* the name by which it is still best known in gardens; he afterwards merged it in Zygopetalum. It is very near *Zygopetalum marginatum,* from which it is chiefly distinguished by its much narrower leaves and smaller flowers, of which the petals are comparatively broader and the lip differently lobed.

Z. gramineum.

Leaves radical, narrowly lanceolate, acute, conduplicate at base, 5—8 inches long. Peduncles clustered, slender, 2—3 inches long, one-flowered, bi-bracteate at the base of the ovary, and with a single, smaller subulate bract near the base of the peduncle. Flowers 1¼ inch in diameter; sepals and petals oval-oblong, light yellow-green with lines of red-purple dots; lip broadly ovate, concave, minutely denticulate at the margin, yellow densely spotted on the disk with red-purple, the spots smaller and fewer towards the margin; crest a four-lobed maroon-purple plate of peculiar shape not easily described.* Column semi-terete, downy above, spotted like the perianth.

Zygopetalum gramineum, Lindl. in Bot. Reg., 1844, misc. No. 15. Rchb. in Walp. Ann. VI. p. 657. Kefersteinia graminea, Rchb. in Bot. Zeit. 1852, p. 634. Id. *Xen. Orch. I.* p. 67, t. 25. fig. 2. *Bot. Mag.* t. 5046.

First detected by Hartweg about the year 1841 on the Pacific side of the Western Cordillera of New Granada near Popayan, but not introduced by him. According to Reichenbach† it was shortly afterwards found by Linden in Merida at 5,000 feet elevation, and a few years later by Funck and Schlim in the same province. It was subsequently collected in Caracas by Wagener, by whom it was introduced into Germany. On its flowering in German gardens Reichenbach named it *Kefersteinia graminea* in compliment to Herr Keferstein, at that time the possessor of one of the best orchid collections in Germany, but afterwards restored it to Zygopetalum to which it had been, in the first place, referred by Lindley.

Z. graminifolium.

Pseudo-bulbs about the size of a filbert, from a slender creeping rhizome, bearing at their apex 3—5 linear or linear-lanceolate, acuminate, grass-like leaves 8—12 inches long. Scapes erect, stoutish for the size of the plant, longer than the leaves, 5—7 flowered; bracts sheathing, ovate or lanceolate, acute. Flowers 2 inches in diameter; sepals and petals similar and sub-equal, spathulate-oblong, acute, bronzy blackish brown with some green spots and markings; lip broadly obovate or obcordate, emarginate, convex, violet-blue streaked with white; crest large, horse-shoe shaped, ridged and furrowed, deep violet-blue. Column clavate, bent, violet-blue above, white below the stigma.

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* Callus baseos depressus carnosus nunc rhombeus, nunc triangulus, dimidio antico grosse (*sic*) dentato, sinu semper in medio.—Rchb. Xen. Orch. I. p. 68.

† Xen. Orch. loc. cit. supra.

Zygopetalum graminifolium, Rolfe in Gard. Chron. XII. s. 3. (1892), p. 179. *Lindenia, VIII.* t. 339.

This is a recent addition to the section EUZYGOPETALUM, having for its nearest affinity *Zygopetalum maxillare,* from which it is distinguished by its more slender rhizome, smaller pseudo-bulbs, and narrow grass-like leaves.* It was introduced by Messrs. Sander and Co. from South Brazil, where it grows on the stems of *Lomaria Boryana* and probably other tree-ferns. We are indebted to Mr. C. J. Lucas, of Warnham Court, for materials for description.

Z. grandiflorum.

Pseudo-bulbs ovoid, furrowed, 2—3 inches long, diphyllous. Leaves broadly lanceolate, acuminate, upwards of a foot long. Scapes much shorter than the leaves, 3—5 flowered; bracts ovate-lanceolate, acute, about half as long as the furrowed ovary, pale green. Flowers 3 inches in diameter; sepals and petals broadly lanceolate, much acuminated, light green with 5—7 longitudinal brown bands; lip broadly ovate, acuminate, three-lobed, the side lobes roundish oblong, erect, much lacerated at the margin, white; the front lobe with dentate margin reflexed, white with 10—12 longitudinal, red-purple raised lines; crest semi-circular, covering the basal third of the lip, ridged and furrowed, orange-yellow, the ridges red and with projecting teeth in front. Column terete and white above; wings oblong, projecting, the front margin fringed.

Zygopetalum grandiflorum, Benth. in Gen. Plant. III. p. 543. (1883). Batemania grandiflora, Rchb. in Bonpl. IV. p. 328. (1856). Id. in Walp. Ann. VI. p. 555. *Bot. Mag.* t. 5567.

Originally introduced from New Granada by Linden, but we find no date or locality recorded. Among the earliest cultivators of this orchid in this country was the late Mr. Sigismund Rucker, in whose collection at West Hill, Wandsworth, it flowered in 1865, on which occasion the plant was figured in the *Botanical Magazine.* For materials for description we are indebted to Mr. Charlesworth, of the firm of Charlesworth and Shuttleworth, of Bradford and Clapham, who detected it in the province of Truxillo, in northern Peru. It is an anomalous species placed by Mr. Bentham in the section HUNTLEYA, but differing from the sectional type in having pseudo-bulbs and a 3—5 flowered inflorescence.

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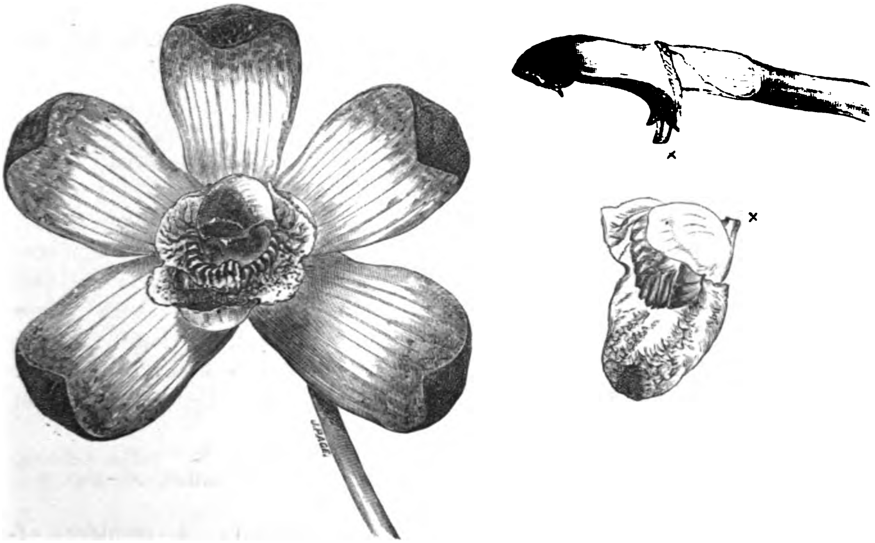
* So far as regards these characters, the plant is sufficiently distinct from *Zygopetalum maxillare*; but in its floral characters it differs so little as to suggest a doubt as to its claim to specific rank. Its precise habitat is withheld, which precludes for the present any hypothesis of its being a geographical form of *Z. maxillare.*

Z. Klabochorum.

Pseudo-bulbs none. Leaves tufted, equitant at the base, lanceolate, acute, 12—15 inches long, and about 2 inches broad. Peduncles short with 1—2 joints at each of which is a small, subulate, brownish bract, and a similar larger one at the base of the ovary, one-flowered. Flowers fleshy with spreading segments, 3½—4 inches in diameter; sepals and petals oval-oblong, sub-acute, more or less incurved at the tips, the basal half white, the apical half brownish purple; lip half as long as the other segments, ovate-oblong when spread out, the margin incurved and with a shallow sinus at the apex, white densely covered with crimson-purple papillæ; crest prominent, semi-circular, scolloped into parallel ridges that are crimson-purple, the furrows between them white. Column crimson-purple, short, triquetral, concave below the stigma.



Zygopetalum Klabochorum.

Zygopetalum Klabochorum, Rchb. in Gard, Chron. XI. (1879), p. 684. Pescatorea Klabochorum, Rchb. in Gard. Chron. loc. cit.; and XII. (1879), p. 167. Williams' *Orch. Alb. I.* t. 17. Paxt. *Fl. Gard.* re-issue I. t. 21. Regel's *Gartenfl.* 1890, t. 1324.

This is one of the finest of the species included in the section Warscewiczella, but unfortunately, like many of its congeners, it is a refractory subject under cultivation, and thus far no information has been accorded respecting the conditions under which it grows in its native country. It was discovered by Franz Klaboch in Ecuador, and was dedicated by Reichenbach to him and his brother conjointly, both of whom fell victims to the toils and dangers of orchid-collecting on the Andes of Ecuador and Colombia. It flowered for the first time in this country in several collections in the summer of 1879, the flowers showing some variability in the depth and extent of coloration. Although no locality is recorded, *Zygopetalum Klabochorum* has since been imported from Ecuador; its habitat is therefore known to orchid collectors in that country. We are indebted to Mr. C. J. Lucas, of Warnham Court, for the flower here figured.

Z. Lalindei.

"Leaves elliptic-lanceolate, acuminate, gradually narrowed below, a foot long more or less, strongly five-nerved. Flowers 2½—3 inches broad, on peduncles about 3 inches long with 2—3 sheathing bracts; sepals spreading and recurved at the tip, broadly ovate-oblong, rose coloured with straw-yellow tip, the lower margin of the lateral two also straw-yellow; petals oblong, obtuse, rose-coloured with white margins; lip ovate-hastate, margins and tip recurved, the latter obtusely pointed, golden yellow; disk with raised, close-pressed smooth lamellæ. Column broader than the raised disk of the lip, arched, rose coloured."—*Botanical Magazine.*

Zygopetalum Lalindei, Rchb. in Gard. Chron. II. (1874), p. 33. Bollea Lalindei, Rchb. in Gard. Chron. loc. cit. *Bot. Mag.* t. 6331. B. Patinii, *Fl. Mag.* N.S. t. 147.

A handsome species discovered by M. Lalinde, a resident of Medellin, in New Granada, by whom it was sent to Europe through M. Patin, a Belgian, settled in the same city. A very noticeable structural peculiarity is the great breadth of the column, the distinguishing character of the section Bollea, which in this species completely arches over the plaited palate of the labellum, and is even broader in proportion to the size of the flower than in the closely allied *Zygopetalum cœleste.*

Z. lamellosum.

"Leaves narrowly lanceolate, about a foot long, narrowed to the base, five-nerved. Peduncles stout, 3 inches long with two appressed, oblong-obtuse sheaths, and a similar bract appressed to the ovary. Flowers 2½ inches in diameter, of a nearly uniform yellow colour, except the lip which is yellowish white with an orange and brown crest; dorsal sepal elliptic, acute; lateral two larger, oblong; petals spathulate-oblong, acute; lip nearly orbicular in outline with a cordate base, concave with decurved margin; crest semi-circular, much raised and formed of narrow, close-set, concentric plates. Column stout, curved, striated down the face."—*Botanical Magazine.*

Zygopetalum lamellosum, Benth. in Gen. Plant. III. p. 543 (1883). Pescatorea lamellosa, Rchb. in Gard. Chron. IV. (1875), p. 225. *Bot. Mag.* t. 6240.

Introduced by us from New Granada about the same time as *Zygopetalum Dayanum,* to which it is closely allied. It was one of the discoveries of Gustav Wallis while collecting for us in that rich orchid region, but who never divulged the localities in which they were made. It seems to have long since disappeared from cultivation.

Z. Lehmanni.

Leaves distichous, the lower ones reduced to foliaceous scales, the upper ones linear-ligulate, acute, upwards of a foot long. Peduncles about one-third as long as the leaves, one-flowered; bracts lanceolate, acute, pale brown. Flowers fleshy, 2½—3 inches in diameter; sepals and petals plum-purple with symmetrical longitudinal white stripes, white at the very base; the sepals elliptic-oblong, with a yellowish green apiculus; the petals broader, obovate-oblong, obtuse; lip oval-oblong, emarginate, with two small erect, triangular, basal auricles that are vinous purple; the blade densely studded with bristle-like papillæ arranged in close-set lines; crest large, semi-circular, ridged and furrowed, chestnut-brown. Column triquetral, slightly curved, vinous purple.

Zygopetalum Lehmanni, Rchb. in Gard. Chron. XII. (1879), p. 424. Pescatorea Lehmanni, Rchb. in Gard. Chron. loc. cit. Williams' *Orch. Alb. II.* t. 57. Regel's *Gartenfl.* 1883, t. 1123.

Discovered by and named after Mr. F. C. Lehmann, the German Consul in New Granada, who sent it to M. Ortgies, of the Botanic Garden at Zurich. No locality is recorded, but it is said to occur at an altitude of 3,500—4,500 feet, where the temperature is very equable—17°—19° C. (64°—67° F.) average mean—and the humidity very copious throughout the year. It is without doubt a beautiful orchid, but like many of its congeners it is a difficult plant to import alive, and it has thus far baffled the efforts of cultivators to grow it successfully.

Z. Lindenii.

Pseudo-bulbs none. Leaves ligulate or broadly oblanceolate, acute, narrowed and conduplicate at the base, 7—9 inches long. Peduncles very short, pale green, one-flowered; bracts sheathing, lanceolate, acute, ½ inch long. Flowers 3 inches across vertically, white with some longitudinal and rayed purple streaks on the disk of the lip; sepals and petals lanceolate, acuminate, the lateral sepals a little longer than the dorsal one; lip obscurely three-lobed, broadly obcordate or sub-orbicular with crenulate margin, the basal lobes small, triangular, incurved; crest broadly triangular, bi-cuspidate. Column triquetral, bent.

Zygopetalum Lindenii, Rolfe in *Lindenia VIII.* t. 337. Warscewiczella Lindenii, Journ. of Hort. June, 1892. p. 461, icon. xyl.

A handsome species belonging to the section WARSCEWICZELLA, recently introduced by L'Horticulture Internationale of Brussels, and exhibited at a meeting of the Royal Horticultural Society of England on June 7th, 1892. Its habitat has not been divulged.

Z. Mackayi.

Pseudo-bulbs ovoid, 2—3 inches long, much wrinkled when old, di-triphyllous. Leaves linear-lanceolate, sub-acuminate, conduplicate at base, 12—20 inches long, distinctly nerved. Scapes stoutish, 20—30 or more inches long, 5—7 or more flowered; bracts somewhat inflated, ovate, acute, nearly as long as the ovaries. Flowers distant, 3 inches across vertically; sepals and petals similar and equal, ligulate-lanceolate, acute, light yellow-green blotched with purplish brown; lip broadly clawed, auricled at the base, and then suddenly enlarged into a broad fan-shaped, emarginate blade, white spotted and streaked with violet-purple, the streaks and spots often arranged in radiating lines; crest horse-shoe shaped, regularly ridged and furrowed, toothed along the front margin. Column clavate, triquetral, yellow-green spotted with red-brown, whitish below the stigma.

Zygopetalum Mackayi, Hook. in *Bot. Mag.* t. 2748 (1827). Lindl. Gen. et Sp. Orch. p. 187. Id. in Bot. Reg. 1844, misc. No. 15. Rchb. in Walp. Ann. VI. p. 661. Williams' *Orch. Alb. IX.* t. 427. Eulophia Mackaiana, Lindl. in *Bot. Reg.* t. 1433 (1831).

var.—crinitum.

Flowers usually smaller; the veins of the labellum fringed with short papillose bristles that are sometimes violet-blue, sometimes red-crimson; marginal area pure white.

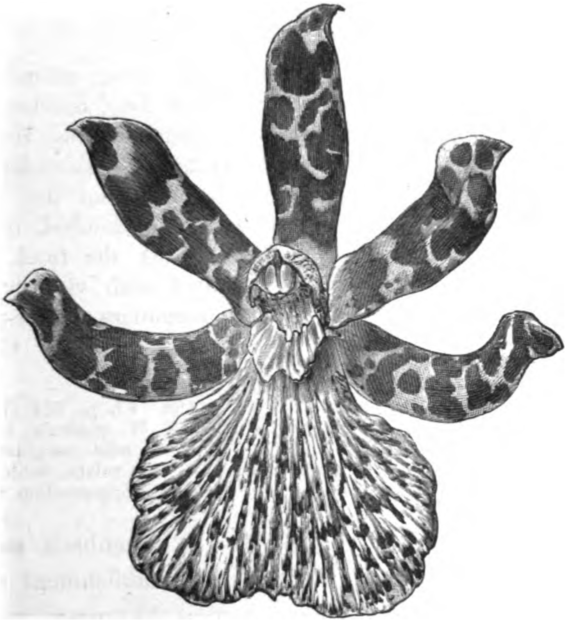
Z. Mackayi crinitum, Lindl. Gen. et Sp. Orch., p. 187. *Bot. Mag.* t. 3402. Z. crinitum, Lodd. *Bot. Cab.* t. 1687. Lindl. in Bot. Reg. 1844. misc. No. 15. Rchb. in Walp. Ann. VI. p. 661. Williams' *Orch. Alb. IX.* t. 410. *The Garden, XLII.* (1892) t. 870.

var.—intermedium.

Pseudo-bulbs longer and narrower. Leaves longer and more acuminate. Scapes shorter, stouter, and fewer-flowered; the coloured lines on the lip paler, much interrupted and broken up into spots.

Z. Mackayi intermedium, supra. Z. intermedium, Lindl. in Bot. Reg. 1844, misc. No. 15. Sander's *Reichenbachia, I.* t. 15. *Lindenia, V.* t. 216. Z. Mackayi, Paxt. *Mag. Bot. III.* p. 97. Rchb. in Walp. Ann. VI. p. 661.

The typical form was introduced from Brazil in 1826 by Mr. Mackay, of the Trinity College Botanic Garden at Dublin. The variety *crinitum* first appeared in the Wentworth collection of Earl Fitzwilliam in 1835, and two years afterwards it was gathered by Gardner on the Organ Mountains. The variety *intermedium* first appeared in 1837 in the collection of Mr. Bowe, of Manchester, when it was figured in Paxton's *Magazine of Botany* as *Zygopetalum Mackayi*, its deviation from the original form not being then noticed. The geographical range of the species has been vaguely stated to be southern Brazil, from Santa Catherina to the Organ Mountains, probably along the coast range between 28° and 22° S. The two



Zygopetalum Mackayi.

varieties, of which the habitat of one only appears to be certainly known, may thence be geographical forms, but more definite information respecting the precise localities in which the type as well as its varieties occur, is much required.

Zygopetalum Mackayi has always been in high repute among cultivators on account of the pleasant perfume of its flowers which generally appear in the autumn and winter months, and on account of the facility with which it adapts itself to the artificial conditions of the glass-houses of Europe, so much so that it is one of the few orchids met with in gardens where but few others are cultivated.

Z. marginatum.

Leaves radical, in tufts of fours and fives, oblanceolate, acute, 6—12 inches long. Peduncles 4—5 inches long, one-flowered; bracts small and sheathing. Flowers 2—2½ inches across vertically, very fragrant; sepals and petals yellowish white, ovate-lanceolate, acute, the lateral sepals narrower and the petals broader than the dorsal sepal; lip sub-orbicular when spread out, obscurely three-lobed, the side lobes incurved towards the column, yellowish white; the front lobe slightly concave, retuse or emarginate, white striated with violet-purple on the disk and with a broad margin of rose—sometimes mauve-purple; crest prominent, sub-quadrate, strongly ridged and furrowed. Column short, semi-terete, white.

Zygopetalum marginatum, Rchb. in Walp. Ann. VI. p. 654 (1863). Warrea marginata, Rchb. in *Bot. Zeit. X.* (1852). p. 636. W. quadrata, Lindl. in Gard. Chron. 1853, p. 647. *Bot. Mag.* t. 4766. Warscewiczella marginata, Rchb. *Xen. Orch. 1.* p. 61, t. 23, fig. 2. Linden's *Pesc.* t. 6. W. velata, Rchb. Xen. Orch. I. p. 60 (1854), fig. 1. Batem. in *Bot. Mag.* t. 5582. Zygopetalum velatum, Rchb. in Walp. Ann. VI. p. 655.

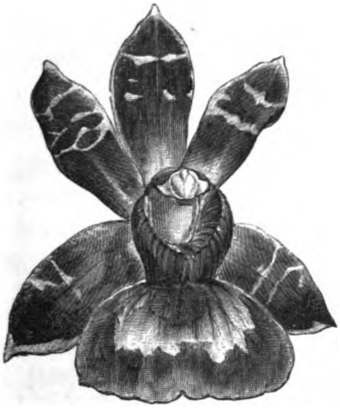
The origin of this species is obscure. Reichenbach states that it first appeared in M. Linden's horticultural establishment at Brussels, whence it became distributed among several European gardens; and in *Pescatorea* the merit of introducing it is assigned to Linden, but no information is given as to date, although New Granada is stated to be its native country. The first recorded instance of its flowering in England was in Jackson's nursery at Kingston, in 1853; the plant was supposed to have been collected by Warscewicz in Central America. This collector had given Reichenbach a sketch and herbarium specimen of a Warscewiczella without indicating any locality, and which he afterwards named *W. velata*. Some years later a Warscewiczella was collected in New Granada by Blunt for

Messrs. Low and Co., which on flowering was referred by Reichenbach to *W. velata.* The late Mr. Day informed us that Blunt's plants proved somewhat variable in the size and colour of the flowers, and that he was unable to distinguish some of the forms from the original *W. marginata* which he had cultivated.

The above description was taken from a plant that flowered in our houses a few years ago, and on comparing the flower with the plates of *Warrea quadrata* and *Warsceuiczella velata* in the *Botanical Magazine* it proved to be intermediate between them. We have therefore no hesitation in reducing the latter to a synonym of the former,* or which is the same thing, in referring both to *Zygopetalum marginatum*.

Z. maxillare.

Rhizome creeping, flexuose, as thick as an ordinary writing pencil. Pseudo-bulbs ovate-oblong, 2—3 inches long, more or less compressed, diphyllous. Leaves narrowly lanceolate, sub-acuminate, prominently veined, narrowed at the base, 8—15 inches long. Scapes erect or slightly nodding, as long as or longer than the leaves, 5—7 or more flowered; bracts brown, ovate, acute, about an inch long. Flowers 2½ inches across vertically; sepals and petals spreading, bronzy brown with light green transverse streaks; the sepals oval-oblong, apiculate; the petals similar but narrower; lip three-lobed, the side lobes narrowly oblong, erect, joined to the semi-lunate violet-purple, fleshy crest that is



Zygopetalum maxillare.

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* The analytical details of the two forms in *Xenia Orchidacea, I.* t. 23, appear to have been drawn from imperfect materials; they are evidently too crude to be reliable.

ridged and furrowed on the inner side; the front lobe sub-orbicular with sinuate margin, violet-blue, paler at the margin. Column broad, arched, concave below the stigma.

Zygopetalum maxillare, Lodd. *Bot. Cab.* t. 1776. Lindl. Gen. et Sp. Orch. p. 188 (1832). Id. in *Bot. Reg.* 1844, misc. No. 15. Paxt. *Mag. Bot. IV.* p. 271 (1838). *Bot. Mag.* t. 3686. Rchb. in Walp. Ann. VI. p. 660.

var.—Gautieri.

Plant somewhat more robust. Flowers a little larger with all the segments broader; the violet-blue of the labellum sometimes spotted and striated with deeper blue.*

Z. maxillare Gautieri, Regel's *Gartenfl. XIX.* t. 644. Z. Gautieri, *Illus. hort. XIV.* t. 535. Williams' *Orch, Alb. I.* t. 28. *Lindenia, VI.* p. 284.

Zygopetalum maxillare was originally introduced from Rio de Janeiro in 1829 by Messrs. Loddiges through their correspondent, Mr. Warre. Nine years later it was detected on the Organ Mountains by Gardner, who was the first to communicate to Dr. Lindley the fact that this orchid always grows on the stems of tree-ferns, upon pieces of which it is often imported. The variety *Gautieri* differs so little from the original form that we hesitatingly give it even varietal distinction; it was originally sent to M. Verschaffelt, of Ghent, in 1867, from Santa Catherina, in southern Brazil, by M. Gautier.

The species was named *maxillare* by Messrs. Loddiges, from the fanciful resemblance of the crest and column to the jaws of an animal; the rich violet-blue of the labellum—an unusual colour in orchids—has caused the species to be much appreciated by amateurs.

Z. Meleagris.

Leaves distichous and alternate, ligulate, acute, equitant at base, 9—12 inches long. Peduncles much shorter than the leaves, one flowered. Flowers fleshy, 3 inches in diameter; sepals and petals similar and sub-equal, spreading, ovate-lanceolate, acuminate, white at the base, yellow in the centre, and the apical half red-brown speckled with yellow; lip with a short broad claw and cordate, apiculate blade, white with the apical area yellowish brown, and with a semi-circular fringed white crest at the base. Column acutely triquetral, white with a bilobed greenish wing on each side of the stigma.

Zygopetalum Meleagris, Benth. in Gen. Plant. III. p. 543 (1883). Huntleya Meleagris, Lindl. in *Bot. Reg.* 1838, misc. No. 20; and 1839, t. 14. Godefroy's *Orchidophile,* 1889, p. 49. Batemania Meleagris, Rchb. Xen. Orch. I. p. 185, t. 66. figs. 1 and 2. Id. in Walp. Ann. VI. p. 555. Regel's *Gartenfl.* 1883. t. 1114, fig. 2.

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* In the typical form figured in *L'Illustration horticole*, the anterior lobe of the lip is white.

A native of southern Brazil, first discovered by Descourtilz in the early part of the present century in damp woods on the banks of the Rio de Pirapitinga, near Bananal, in the province of Minas Geraes. It was introduced by Messrs. Rollisson, in whose nursery at Tooting it flowered in 1838, but it was very rare in European gardens for many years afterwards, and even at the present time it is not often seen. We are indebted to Baron Schroeder for materials for description.

The specific name *Meleagris* is the Greek name of the Guinea-fowl, and was doubtless suggested by the fancied resemblance of the curious spotting of the flower to that of the plumage of the Guinea-fowl.

Z. rostratum.

Rhizome stoutish, sheathed with imbricating, ovate, acute scales. Pseudo-bulbs oblong, much compressed, mono-diphyllous. Leaves lanceolate, acute, 7—10 inches long. Scapes much shorter than the leaves, 1—2 flowered; bracts foliaceous, ovate, acute, ½-inch long. Flowers 3½—4 inches across vertically; sepals and petals similar, linear-lanceolate, acuminate, more or less undulated or twisted, pale brown tinged with rose, white at the base, greenish at the apex; lip large, cordate, acuminate, recurved at the tip, white with some purplish streaks at the base; crest horse-shoe shaped, obscurely ribbed and furrowed, light yellow streaked with purple. Column semi-terete with two short sub-rotund wings; anther beaked.

Zygopetalum rostratum, Hook. in *Bot. Mag.* t. 2819 (Zygopetalon), Lindl. in Bot. Reg. 1844, misc. No. 15. Williams' *Orch. Alb. II.* t. 78. *Lindenia II.* t. 68. Zygosepalum rostratum, Rchb. in Walp. Ann. VI. p. 666.

Very little is recorded of this remarkable orchid since it first became known to science. Sir William Hooker, who first described it, states that it was introduced from Demerara in 1827 by Mr. C. S. Parker, of Liverpool.* Thirteen years later the brothers Schomburgk found it growing on the trunks of trees along the banks of the Demerara and Essequibo rivers.† After them a German gardener visiting Surinam gathered it near Mariepaston.‡ And lastly Mr. Everard im Thurm met with it on the banks of the Barabara river in north-west Guiana, "in the dense shade, clinging close to the undersides of the tree stems, almost dipping into the water."§

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* Bot. Mag. sub. t. 2819. † Reisen, III. p. 912. ‡ Walp. Ann. VI. p. 666.

§ Proceedings of Royal Geog. Soc. XIV. p. 675 (1892), whence we learn its peculiar habit which may partly account for the indifferent success that has hitherto attended its cultivation.

From these notes it appears to be spread over the littoral region of Guiana, always in shade in proximity to water. The specific name *rostratum*, "beaked," refers to the beak-like prolongation at the apex of the column.

Z. stapelioides.

Pseudo-bulbs about the size of a filbert, compressed, with a rib on each of the flattened sides, di-triphyllous. Leaves broadly lanceolate, acute, 3—4 inches long, greyish green. Scapes spreading or sub-pendulous, as long as the leaves, 1—2 flowered; bracts small, ovate, acute, sheathing. Flowers 1½—2 inches in diameter; sepals and petals ovate-oblong, acute, keeled at the back, pale green spotted and barred with brown-purple, the petals a little broader and more densely spotted than the sepals; lip three-lobed, the side lobes roundish oblong, erect, coloured like the sepals; the intermediate lobe orbicular, concave, lurid purple, sometimes freckled with light yellow; crest a semi-lunate plate with a broad raised keel at the middle. Column semi-terete, pale green; rostellum beaked.

Zygopetalum stapelioides, Rchb. in Walp. Ann. VI. p. 658 (1863). Maxillaria stapelioides, Lindl. Gen. et Sp. Orch. p. 146 (1832). Id. in *Bot. Reg.* 1839, t. 17. *Bot. Mag.* t. 3877. Promenæa stapelioides, Lindl. in Bot. Reg. 1843, misc. p. 13.

A dwarf species first detected by Herr Link, Director of the Botanic Garden at Berlin, during a mission to Brazil some time prior to 1830. It was afterwards gathered by Gardner on the Organ Mountains near Rio de Janeiro, by whom it was introduced into British gardens, where it is best known under the name of *Promenæa stapelioides.* The specific name refers to the Stapelia-like spotting of the flowers.

Z. Wailesianum.

Pseudo-bulbs none. Leaves linear or linear-lanceolate, acute, 6—8 inches long. Peduncles half as long as the leaves, one-flowered; bracts sub-triangular, acute, sheathing. Flowers 1½—2 inches in diameter, white with a violet-blue disk on the lip, the crest of which is also marked with violet-blue lines; sepals and petals similar, ovate-lanceolate, acute; lip broadly obcordate or sub-quadrate, cuneate at the base, obscurely lobed, the basal lobes small and incurved; crest semi-lunate with five keels terminating in front in as many projecting teeth. Column triquetral, arched.

Zygopetalum Wailesianum, Rchb. in Walp. Ann. VI. p. 656 (1863). Id. *Xen. Orch. III.* p. 50, t. 222 (very poor). Warrea Wailesiana, Lindl. in Journ. Hort. Soc. IV. p. 264 (1849). Id. in Paxt. Fl. Gard. I. p. 73, icon xyl.

One of the discoveries of Gardner in southern Brazil during an excursion up the river Parahiba in search of *Zygopetalum Meleagris.* He sent a plant to Mr. George Wailes, of Newcastle-on-Tyne, which flowered in 1849, on which occasion it was named *Warrea Wailesiana* by Dr. Lindley. It was afterwards detected in the province of Bahia by Porte, one of M. Linden's collectors; and it has recently been sent to Europe by Binot, a French collector residing at Petropolis, on the coast-range near Rio de Janeiro. Our description was taken from a plant in the Royal Gardens at Kew; it is unquestionably one of the most attractive species in the section to which it belongs (Warscewiczella).

Z. Wendlandi.

Leaves in tufts of 5—7, distichous and alternate, the lowermost reduced to leafy scales, the upper ones linear-ligulate or lanceolate, acute, 7—10 inches long. Peduncles 3—4 inches long, enclosed by a leafy sheath at the base, bi-bracteate at the base of the ovary, one-flowered. Flowers 2½ inches in diameter; sepals and petals similar, lanceolate, acute, pale yellowish green, the petals a little smaller than the sepals; lip shortly clawed, sub-orbicular, crisped and irregularly dentate at the margin, recurved at the apex, the central area light violet-blue, the marginal area white; crest semi-lunate scolloped into slightly divergent ridges, violet-blue. Column short, white, terete above, winged at the apex.

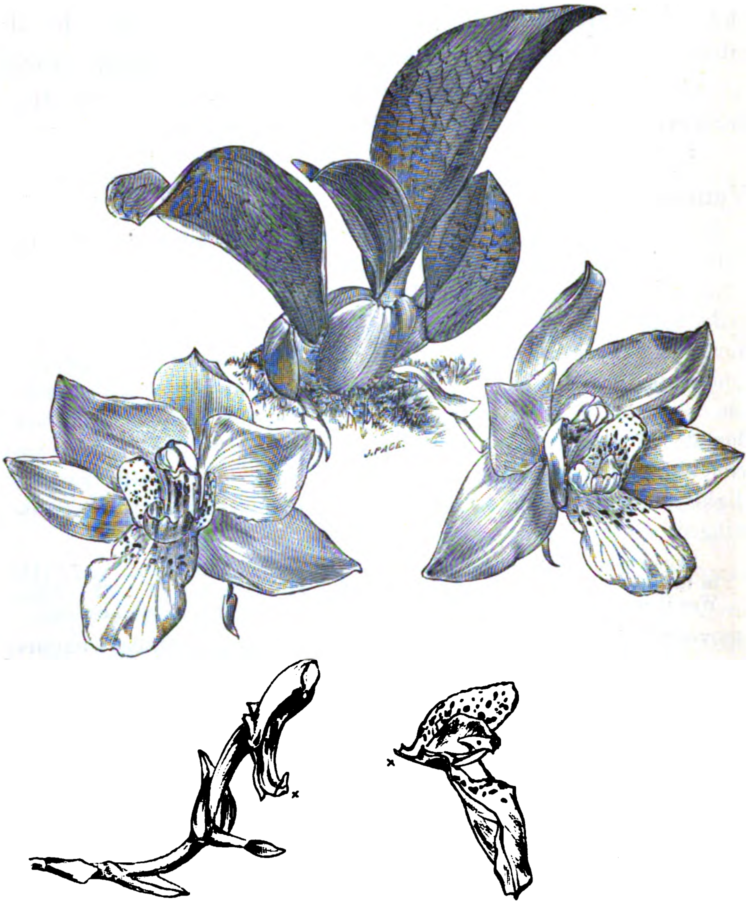
Zygopetalum Wendlandi, Rchb. in Beitr. Orch. Centr. Amer. p. 74 (1860). Id. in Regel's *Gartenfl.* 1888, t. 1267. Sander's *Reichenbachia, II.* t. 53. Warscewiczella Wendlandi, Rchb. in lit. ex Williams' *Orch. Alb. III.* t. 126 (discolor).

Discovered by Herr Wendland during a botanical excursion to Costa Rica undertaken in 1858—59 at the request of the late King George of Hanover, and sent by him to the Herrenhausen Berggarten. It has since been imported into this country, and was quite recently represented in several orchid collections.

Z. xanthinum.

Pseudo-bulbs ovoid, compressed with acute edges, sub-tetragonal when old, about an inch long, diphyllous. Leaves oval-oblong, shortly petiolate, 2—3½ inches long. Peduncles shorter than the leaves, with an ovate, acute, membraneous bract at the base and a similar one at the base of the ovary, 1—2 flowered. Flowers about 2 inches in diameter, bright citron-yellow with some red spots on the lip and column; sepals ovate, acute, keeled behind; petals broader, elliptic-oblong acute; lip three-lobed, the side lobes oblong, obtuse, erect; the intermediate lobe obovate-oblong, spreading; crest a semi-lunate, erect, fleshy plate toothed at the edge and with a tubercle on the inner side. Column triquetral, bent, concave below the stigma.

Zygopetalum xanthinum, Rchb. in Walp. Ann. VI. p. 659 (1863). Sander's *Reichenbachia*, 2nd ser. I. t. 11. Z. citrinum, Nicholson, Dict. Gard. IV. p. 245. Rolfe in Gard. Chron. III. s. 3 (1888), p. 94. Promenæa xanthina, Lindl. in Bot. Reg. 1843, misc. p. 13. P. citrina, Don. Hort. Camb. ed. 13, p. 720 (1845), ex Williams' *Orch. Alb. I.* t. 7. Maxillaria xanthina, Lindl. in. Bot. Reg. 1839, sub. t. 17.



Zygopetalum xanthinum.

This is one of the prettiest and most distinct of the genus; it is free flowering and of easy culture, and on account of its dwarf habit, occupying but little space. It has long been known in gardens as *Promenæa citrina,* for Lindley's original name, *xanthina,* which is equally appropriate, seems to have been lost sight of for many years. The date of its introduction does not appear to have been recorded, although it is highly probable that living plants were sent home by Gardner, who detected it on the Organ Mountains in 1837. Lindley named and described the plant from Gardner's specimens as *Maxillaria xanthina*, but afterwards separated it from that genus, founding upon it and other allied species a new genus, which he called Promenæa. Lindley believed this plant to be the same species as that discovered in the early part of the present century by Descourtilz on the coast-range of Minas Geraes (Ilha Grande), and which he called *Epidendrum Jonquille*; if so, the intrepid French traveller and explorer was the actual discoverer of this interesting orchid.

HYBRID ZYGOPETALUMS.

Hybrids between species of Zygopetalum are still few in number, and of those that have been raised, the vigorous-growing type species *Zygopetalum Mackayi*, its variety *crinitum* and *Z. maxillare* have participated in the parentage of all of them. Of the four hybrids described below, the first two are the results of crosses effected between the two species mentioned by two different operators, one using the original *Z. Mackayi* and the other its variety *crinitum*; and as a natural consequence the two hybrids very closely resemble each other. A fairly numerous progeny was obtained from both crosses.

The last two are of exceptional interest, for they are generic crosses between Zygopetalum and Colax. In conformity with the nomenclature adopted in this work for bigeneric hybrids they take the name of Zygocolax.* In both cases the progeny was extremely restricted.

Zygopetalum Clayi.

Z. Mackayi crinitum × *Z. maxillare.*

Pseudo-bulbs and leaves intermediate. Flowers as large as those of the seed parent; sepals and petals brownish purple with a narrow green margin and sometimes with a few narrow transverse green streaks; lip nearly as in the pollen parent, purplish blue with darker lines; the ridges of the crest dark violet-blue, the furrows whitish. Column violet-purple above, streaked below the stigma.

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* Thus Sophrocattleya, Part II. p. 92. Phaiocalanthe, Part VI. p. 17.

Zygopetalum Clayi, Rchb. in Gard. Chron. VII. (1877), p. 684. Williams' *Orch. Alb. II.* t. 50.

Raised by Colonel Clay, of Wallassy, Birkenhead.

Z. Sedenii.

Z. maxillare × *Z. Mackayi.*

Pseudo-bulbs and leaves nearly as in *Zygopetalum maxillare.* Racemes 6—9 flowered. Flowers intermediate in size between those of the parents; sepals and petals brownish purple with a metallic gloss and sometimes with 2—3 pale transverse bands; lip bright violet-blue, more or less striated; crest and column dark violet-blue.

Zygopetalum Sedenii, Rchb. in Gard. Chron. II. (1874), p. 290.

Raised by Seden at our nursery. This was the first hybrid Zygopetalum raised.

Zygocolax leopardinus.

Zygopetalum maxillare × *Colax jugosus.*

Pseudo-bulbs ovoid, compressed, 1—2 inches long, diphyllous. Leaves linear-lanceolate, acute, 6—9 inches long. Racemes 3—5 flowered. Flowers 2 inches in diameter; sepals and petals oblong-lanceolate, whitish spotted and marked with brown-purple; lip three-lobed, the side lobes rotund, erect, indigo-blue; the fleshy crest between them nearly as in *Zygopetalum maxillare*, the ridges blue and the furrows white; the front lobe transversely roundish oblong, indigo-blue, sparingly mottled with white. Column broad, purplish blue, anther white.

Zygocolax leopardinus, supra. Zygopetalum leopardinum, Rchb. in Gard. Chron. XXVI. (1886), p. 199.

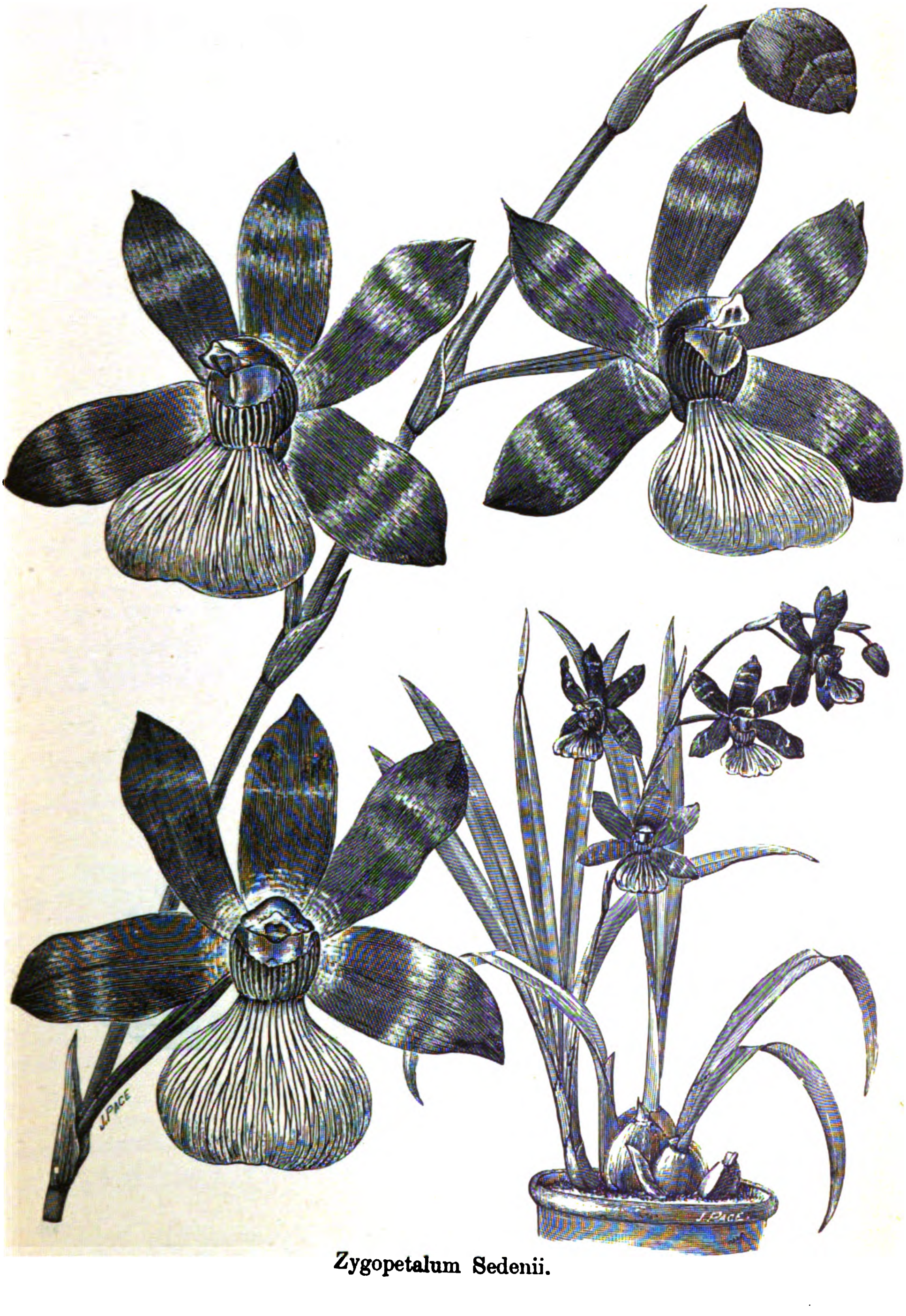
Raised by Seden at our nursery. The influence of the pollen parent seems to have been quite subordinate. It is decidedly the handsomest of the Zygopetalum hybrids yet obtained.

Z. Veitchii.

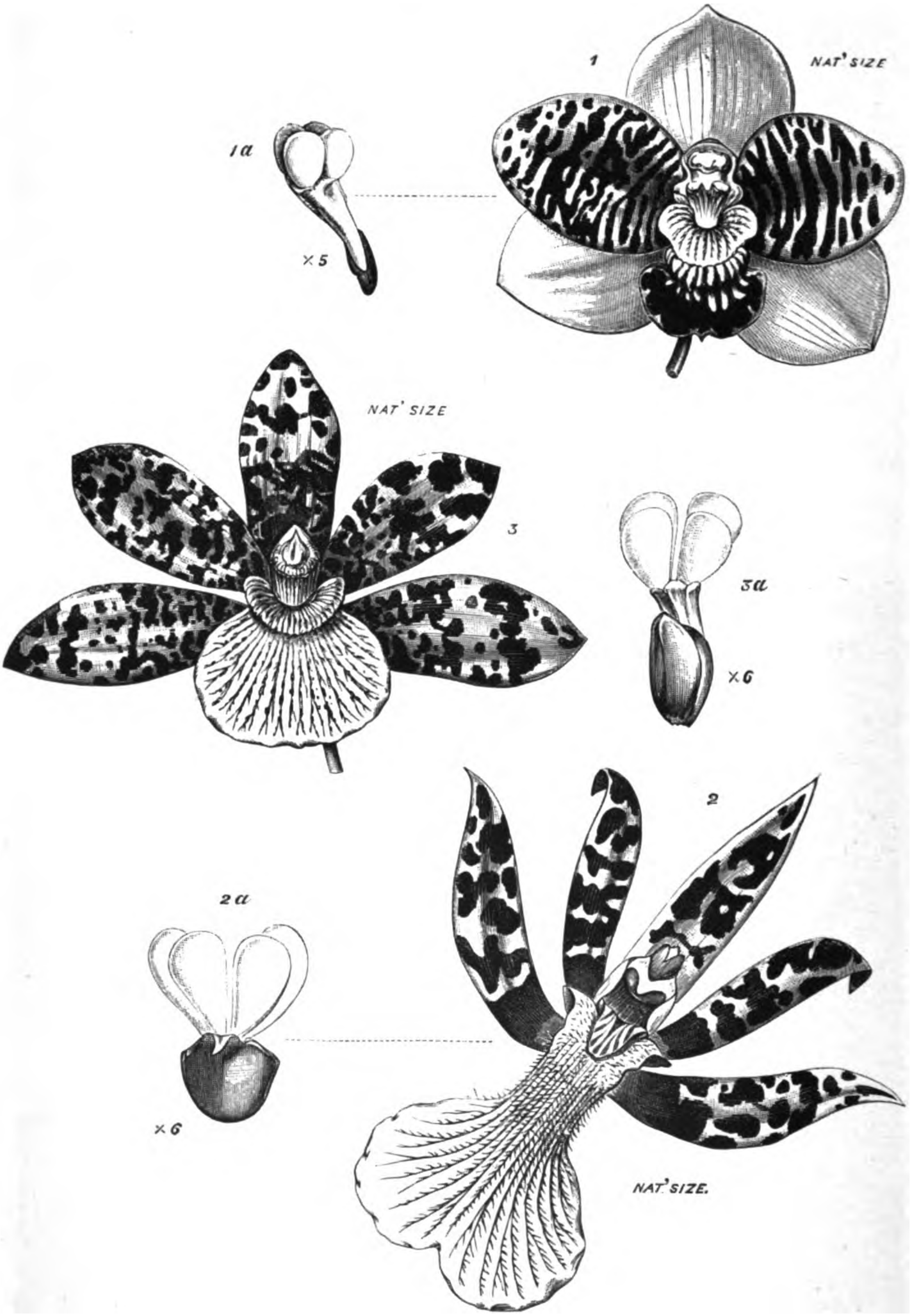
Zygopetalum Mackayi crinitum × *Colax jugosus.*

Pseudo-bulbs broader and shorter than in *Colax jugosus;* the leaves narrower, and the racemes shorter and fewer-flowered than in *Zygopetalum Mackayi.* Flowers 3 inches across the lateral sepals; sepals and petals similar and sub-equal, spreading, broader than in the Zygopetalum, narrower than in the Colax, light yellow-green much spotted and blotched with brown-purple; lip with two basal auricles, sub-orbicular, the central area white with radiating lines of violet-purple papillæ, the marginal area violet-purple striated. Column yellow-green spotted with brown-purple.

Zygocolax Veitchii, Rolfe in Gard. Chron. I. s. 3. (1887), p. 765. Id. in Journ. Linn. Soc. XXIV. p. 170, with figs.



Zygopetalum Sedenii.



1, Colax jugosus; 1a, its pollinia. 2, Maxillaria Mackayi crinitum; 2a, its pollinia.
3, Zygocolax Veitchii; 3a, its pollinia.
(Copied from the Journal of the Linnean Society.)

Raised by Seden at our nursery. In this hybrid the influence of the pollen parent is manifested very distinctly, both in the vegetative organs as described above and in the floral organs as shown very clearly in the accompanying illustration of the hybrid and its parents. In addition we may note that while in Colax the leaves of the young growths appear before the scapes and in Zygopetalum the reverse takes place, in the hybrid the leaves and scapes appear almost simultaneously. This hybrid, whether in its botanical or horticultural aspect, is one of the most interesting we have yet raised.

COLAX.

Lindl. in Bot. Reg. 1843, misc. p. 50. Rchb. in Walp. Ann. VI. p. 553 (1863).

Under Colax Lindley grouped three species from southern Brazil previously referred to Maxillaria,* but which he removed from that genus on account of the peculiar structure of the pollinary appendage; this remarkable structure is shown in the accompanying illustration of *Zygocolax Veitchii*.† Mr. Bentham merged Colax into Lycaste, but its pollinary appendage as clearly distinguishes it from Lycaste as from every other genus, and on that ground it is here retained. Its proved affinity to Zygopetalum through the bigeneric hybrids described in page 66 shows that its systematic place is very near that genus. The generic name is the Greek word κόλαξ, "a parasite."

Colax jugosus.

Pseudo-bulbs elongate-ovoid, 2—3 inches long, diphyllous. Leaves broadly lanceolate, acuminate, 6—9 inches long. Scapes about as long as the leaves, sheathed by pale green acute bracts, 2—3 flowered. Flowers 2—3 inches across transversely; sepals oval-oblong, obtuse, French-white; petals obovate-oblong densely spotted and barred with violet-purple (very rarely with rose-purple); lip shorter than the other segments, shortly clawed, three-lobed, the side lobes rotund streaked with violet-purple; the front lobe semi-circular with numerous fleshy pubescent keels, streaked and blotched with dark violet-purple. Column stoutish, bent towards the apex, hairy in front, spotted with violet-purple.

Colax jugosus, Lindl. in Bot. Reg. 1843, misc. p. 51. Rchb. *Xen. Orch. I.* p. 107. t. 41. Id. in Walp. Ann. VI. p. 553. *Bot. Mag.* t. 5661. *Illus. hort.* 1872, t. 96. Maxillaria jugosa, Lindl. in Bot. Reg. 1840, misc. No. 104. Lycaste jugosa, Benth. in Gen. Plant. III. p. 548.

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* Maxillaria viridis, *Bot. Reg.* t. 1510; M. placanthera, *Bot. Mag.* t. 3173; and M. jugosa, Bot. Reg. 1841, misc. No. 104.

† This appendage is thus described by Mr. Rolfe in the *Gardeners' Chronicle*, I. s. 3 (1887), p. 766:—"It has no distinct gland, but consists entirely of a thin wavy membrane, strengthened by an elevated line in the middle, and gradually narrowing to a line at the point where the gland is usually found."

The horticultural history of *Colax jugosus* is of the briefest description. It was first imported from Brazil by Messrs. Loddiges in 1840, and has doubtless been in cultivation ever since, although it was very rare during the twenty-five years immediately following its introduction. Its precise habitat does not appear to have been recorded, although it is evidently known to the orchid collectors of Rio de Janeiro.

AGANISIA.

Lindl. in Bot. Reg. 1839. misc. No. 65. Benth. et Hook. Gen. Plant. III. p. 544.

A genus of about ten species dispersed over tropical America, in which Mr. Bentham has included *Warrea cyanea* (Lindl.) and Reichenbach's Koellensteinia. The genus is singular in the sub-tribe in which it is placed, in the base of the column not being produced into a foot. The following are the best known species in cultivation.

Aganisia cyanea.

Leaves lanceolate, acuminate, plicate, 7—10 inches long. Peduncles erect, longer than the leaves, racemed and few-flowered along the apical half. Flowers about an inch in diameter; sepals and petals broadly oval-oblong, the sepals white with a faint tinge of blue, the petals veined and margined with indigo-blue; the dorsal sepal concave, the lateral two longer and narrower and the petals smaller than the dorsal sepal; lip fan-shaped, apiculate, undulate, white at the base, the marginal area blue; crest with 4—5 slightly divergent lamellæ. Column clavate, bent.

Aganisia cyanea, Benth. in Gen. Plant. III. p 544 (1883) (*lapsus calami* cinerea). Rolfe in Gard. Chron. VI. s. 3. (1889), p. 492. **Warrea cyanea**, Lindl. in *Bot. Reg.* 1844, misc. No. 3; and 1845, t. 28.

An orchid now but rarely seen, remarkable for the pure blue of its labellum. It was originally imported by Messrs. Loddiges from Colombia, but no locality is recorded. The plant described above is in the collection of Sir Trevor Lawrence, Bart., at Burford Lodge, Dorking.

A. ionoptera.

Pseudo-bulbs clustered, ovoid, about the size of a filbert, mono-diphyllous. Leaves narrowly lanceolate, sub-carminate, 4—7 or more inches long. Scapes purplish, about a foot long, racemed above the middle, 7—10 or more flowered; cauline bracts distant, lanceolate, acute, sheathing; floral bracts similar, shorter than the ovaries, Flowers about an inch in diameter; sepals and petals ovate-oblong acute, the sepals white, but sometimes coloured like the petals, the petals violet-blue, white at the tip; lip broadly pandurate, the basal lobes erect, the front lobe spreading, white streaked with violet-purple; crest fleshy, obscurely bilobed, white spotted with violet-purple. Column terete, very short with two narrow wings.

Aganisia ionoptera, Nicholson, Dict. of Gard. I. p. 35 (1885). *Lindenia, VI.* t. 287. *Bot. Mag.* t. 7270. Koellensteinia ionoptera, Rchb. in Gard. Chron. 1871. p. 1451.

An attractive species first discovered by Gustav Wallis in Peru or Ecuador and sent by him to Messrs. Linden. It has been recently re-imported but its precise habitat has not been divulged. It was originally described by Reichenbach under the name of *Koellensteinia ionoptera.*

A. pulchella.

Rhizome creeping, slender, closely invested with imbricating brown scales. Pseudo-bulbs distant, ovoid, scarcely an inch long, monophyllous. Leaves oval-oblong, acute, 4—5 inches long, narrowed below into a slender petiole half as long as the blade. Racemes erect, as long as the leaves, 4—6 flowered. Flowers more than an inch in diameter; sepals and petals sub-equal, ovate-oblong, acute, white; lip bipartite, the hypochile sub-rotund, concave, spotted with red; the epichile much larger, broadly ovate, entire, with a yellow disk and white margin, and with a yellow glandular crest at its base. Column semi-terete with two incurved wings at the apex.

Aganisia pulchella, Lindl. in *Bot. Reg.* 1839, misc. No. 65; and 1840, t. 32. Rchb. in Walp. Ann. VI. p. 505.

This is the species on which the genus was founded but it is now rarely seen in other than botanic gardens, although rightly characterised by Lindley as a very pretty orchid. It was originally sent by Mr. Brotherton to Messrs. Loddiges in 1839 from British Guiana, where it was shortly afterwards detected by the brothers Schomburgk growing on the stems and branches of trees along the banks of the river Demerara.

ACACALLIS.

Lindl. Fol. Orch. 1853. Benth. et Hook. Gen. Plant. III. p. 544.

A monotypic genus founded by Lindley on a species discovered by Dr. Spruce near Manaos in northern Brazil. Reichenbach afterwards referred it to Aganisia, but Bentham restored it to Acacallis on the ground that the curious appendage to the labellum and the large auricles of the column may warrant its retention as a distinct genus.*

Acacallis cyanea.

Rhizome creeping, as thick as a goose-quill. Pseudo-bulbs produced at intervals of 1—2 inches, ovoid, much compressed, 1½—2 inches long, mono-diphyllous. Leaves oblong-lanceolate, acute, 4—6 inches long, narrowed at the base into a short petiole. Scapes longer than the leaves, slender, purplish, racemose, 3—7 flowered. Flowers 2—2½ inches in diameter; sepals and petals light mauve suffused with white, the sepals broadly oval, obscurely keeled behind; the petals a little broader, sub-orbicular, apiculate; lip with a somewhat long and narrow fringed claw and reniform limb that is rose-purple, concave, undulate at the margin, and very shortly acuminated; crest semi-lunate with a three-toothed appendage in front, ochreous yellow. Column white, triquetral, with two sub-quadrate wings that are rose-purple bordered with white.

Acacallis cyanea, Lindl. Fol. Orch. (1853). Rchb. in Walp. Ann. VI. p. 505. Aganisia cærulea, Rchb. in Gard. Chron. XXV. (1886), p. 720.† Williams' *Orch. Alb. VIII.* t. 374. A. tricolor, *Lindenia, I.* t. 45. A. cyanea, *Lindenia, III.* t. 110 (not of Benth).

This is a very distinct orchid as regards the colour of the flowers and the structure of the labellum. It was first detected in 1851 near the junction of the Amazon and Rio Negro rivers by Dr. Spruce, who reported that in its native forests the sepals and petals are of a pure blue, which has not however been verified in the few plants that have flowered in Europe. It was not introduced into cultivation till many years after its discovery; the earliest notice we find of it is its flowering in the collection of the Honourable Erastus Corning, at Albany, New York, in 1882; and three years later in the garden of Mr. Walter Holland, at Moseley Hill, Liverpool, and this was probably the first occasion of its flowering in England. Owing to the remoteness of its habitat, it has always been a rare plant in European orchid collections.

Cultural Note.—The habitat of *Acacallis cyanea* is in one of the hottest and most humid regions in the world, and therefore it requires the highest temperature available in the orchid houses of this country. On account of its scandent habit it should be affixed to a block of wood or raft; in other respects its cultural treatment is that of orchids usually grown in the East Indian house.

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* Journ. Linn. Soc. XVIII. p. 321.

† The plant described by Reichenbach under this name in the *Gardeners' Chronicle, VI.* (1876), p. 226, is evidently a different species.

ERIOPSIS.

Lindl. in Bot. Reg. 1847, sub. t. 9. Benth. et Hook. Gen. Plant. III. p. 545.

A South American genus, including three or four species, of which the two described below are the best known. The colour of the flowers of these two species, especially of *Eriopsis Rutidobulbon*, is peculiar, and together with their habit, easily distinguishes them from almost every other orchid in cultivation. The essentially distinguishing characters of the genus are, however, the peculiar lamellæ of the lip and the almost quadrangular gland of the pollinary apparatus.

Cultural Note.—Both *Eriopsis biloba* and *E. Rutidobulbon* occur at a considerable elevation on the Cordilleras of South America, and may therefore receive cultural treatment similar to that of other orchids from the same region. They may be grown in the cool house, or better in the coolest part of the Cattleya house during the summer near the glass; but it is advisable to keep them in the intermediate house during the winter months, as in that case they are in an equable temperature the whole year which the climate of their native home suggests.

Eriopsis biloba.

Pseudo-bulbs clustered, ovate-conic, elongated, 2--3 inches long. (Leaves not seen). Scapes radical, 20—25 inches long, dull purple mottled with green, racemose along the distal half, many-flowered; bracts scale-like, minute. Flowers 1¼ inch in diameter; sepals and petals similar and sub-equal, narrowly oblong, obtuse, the sepals tawny yellow bordered with red-brown, the petals darker with more brown; lip concave, transversely roundish oblong with an obcordate lobule at the apex and a sub-quadrate fleshy plate at the base traversed by two raised lines which terminate in front in two teeth; the blade tawny yellow densely dotted with purple. Column clavate, light green.

Eriopsis biloba, Lindl. in *Bot. Reg.* 1847, sub. t. 9. and t. 18. Rchb. in Walp. Ann. VI. p. 662. E. Schomburgkii, Rchb. in Bonpl. III. p. 67 (1855).

When Dr. Lindley founded the genus on this species nothing was known of its origin; the specimen was sent to him by Mr. J. Blandy, of Reading, who had acquired the orchid collection of Mr. George Barker, of Birmingham, shortly after that gentleman's decease in 184[illegible], and among which were many rare species, some of them undetermined at the time. From that time to the present *Eriopsis biloba* has received but little attention from cultivators, and scarcely anything is recorded respecting it. Its geographical range is still unknown to science, although it is certain that it inhabits the northern Cordilleras of South America at a considerable elevation. Materials for description were kindly sent to us by Mr. Shuttleworth, of Park Road, Clapham, who informs us that the plant was received from the Roraima, in British Guiana.*

E. Rutidobulbon.

"Pseudo-bulbs ovate-oblong, 2—3 inches long, of a dark purplish black colour singularly rough or wrinkled, di-triphyllous. Leaves broadly lanceolate, striated and somewhat coriaceous. Scapes 12—18 inches long, dark purple, bearing a many-flowered raceme. Flowers 1½—2 inches in diameter; sepals and petals similar, oblong-obtuse, orange-yellow, red-purple at the margin; lip obtusely spurred at the base, broadly ovate, three lobed, the disk lamellated with a dull crest; the lateral lobes broad, involute; the front lobe small, orbicular, white with dark purple spots, the rest of the lip orange-red dotted with dark purple. Column semi-terete, greenish."—*Botanical Magazine.*

Eriopsis Rutidobulbon, Hook. in *Bot. Mag.* t. 4437 (1849). Rchb. in Walp. Ann. VI. t. 662, and Bonpl. II. p. 281. Williams' *Orch. Alb. VIII.* t. 337. E. biloba, Linden's *Pesc.* t. 20 (not of Lindl.).

Introduced to the Royal Gardens at Kew in 1849 by Purdie, who found it growing on the stem of a Palm tree in the temperate region of Antioquia, in North Colombia, at an elevation of 4,000—5,000 feet. Purdie remarked that it is very rare in the region in which he travelled, and he succeeded in bringing home only one plant, the only one, in fact, that he met with.† The species figured in Linden's *Pescatorea* as *Eriopsis biloba* is evidently not that species, but *E. Rutidobulbon.* In the letterpress accompanying the figure it is stated that Linden discovered the plant in 1841 "dans les petits bois de la Savanna" (wherever that is), associated with *Cypripedium caudatum Lindenii* (*Uropedium Lindenii,* Lindl.) ‡ It continued to be very rare in European gardens for many years after its first introduction; recent importations have caused it to be more generally distributed.

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* It is highly probable that this is not the only station of this plant.

† Bot. Mag. sub. t. 4437.

‡ Under *Uropedium Lindenii,* Pescatorea, plate 2, it is stated that Linden discovered this curious Orchid in 1843 growing among the underwood scattered over the meadow-like Savannahs lying between the Cordillera of Merida and Lake Maracaybo. This is, perhaps, the locality meant, but there is a discrepancy in the dates.

WARREA.

Lindl. in Bot. Reg. 1843, misc. p. 14. Benth. et Hook. Gen. Plant. III. p. 545.

In his revision of Maxillaria in the miscellaneous matter of the *Botanical Register* of 1843, Dr. Lindley separated *Maxillaria Warreana* from that genus on account of the very different form of its perianth, and founded upon it the genus which he named in compliment to Mr. Warre, a correspondent of Messrs. Loddiges, who introduced the plant from Brazil, as they erroneously reported, its actual habitat being in northern Colombia. The only genuine Warrea known to us is the species here noticed, which is a very handsome one, and which should not be omitted from this work, although now but rarely seen.

Warrea tricolor.

"Pseudo-bulbs sub-cylindric, attenuated upwards, 4—5 inches long. Leaves oblong-lanceolate, acuminate, much attenuated at the base, 12—18 inches long. Scapes longer than the leaves, terete, jointed, purple, sheathed with closely appressed bracts, racemed above, 8—10 or more flowered. Flowers large and sub-globose; sepals and petals similar, roundish ovate, concave, acute, white tinged externally with yellow, the two lateral sepals ending below in an obtuse spur; lip obovate, white, beautifully painted within with yellow and dark purple, the basal half concave with three elevated ridges, the apical half spreading, obscurely lobed and waved and with several crisped lamellæ. Column short, semi-cylindric."—*Botanical Magazine.*

Warrea tricolor, Lindl. in Bot. Reg. 1843, misc. p. 14. Rchb. Xen. Orch. I. p. 63. t. 24, figs. 1 and 2. Maxillaria Warreana, Lindl. Gen. et Sp. Orch. p. 148 (1832). Lodd. *Bot. Cab.* t. 1884. *Bot. Mag.* t. 4235.

First cultivated by Messrs. Loddiges in 1829, but it appears to have been but little known till it was introduced from Santa Martha, in northern Colombia, by Purdie to the Royal Gardens at Kew, where it flowered in 1845; its habitat thence became known, and it has since been sparingly imported from the same region.

EXCLUDED SPECIES.

Warrea

candida (Lindl.)	now referred to	Zygopetalum	candidum (Rchb.)
cyanea (Lindl.) ...	„ „	Aganisia	cyanea (Benth.)
discolor (Lindl.) ...	„ „	Zygopetalum	discolor (Benth.)
quadrata (Lindl.) ...	„ „	„	marginatum (Rchb.)
marginata (Rchb.) ...	„ „	„	marginatum (Rchb.)
Wailesiana (Lindl.) ...	„ „	„	Wailesianum (Rchb.)

BATEMANIA.

Lindl. in Bot. Reg. t. 1714 (1835). Benth. et Hook. Gen. Plant. III. p. 540.

Dr. Lindley founded this genus on the plant described below "in compliment to Mr. James Bateman, of Knypersley Hall, Cheshire, an ardent collector and successful cultivator of orchidaceous plants." To this species Reichenbach subsequently added several others, which deviate so much from the type that Mr. Bentham removed them to Zygopetalum, to which they much more nearly conform. The genus Batemania thus reduced is, so far as at present known, monotypic; the single species, however, possesses so little horticultural merit that from an amateur's point of view it very inadequately commemorates the labours of the veteran orchidologist. Our description was taken from a plant in the former collection of Mr. F. G. Tautz, at Studley House, Hammersmith; the species may therefore be still in cultivation. It is named after Colley, Mr. Bateman's collector in Demerara, where he discovered it in 1834

Batemania Colleyi.

Pseudo-bulbs ovate-oblong, compressed, 2—3 inches long, obscurely four-angled and furrowed, mono-diphyllous. Leaves broadly lanceolate, acute, narrowed at the base, 7—10 inches long. Racemes pendulous, 4—7 or more flowered; bracts short, broadly ovate, sub-acute. Flowers distant, about 3 inches in diameter; dorsal sepal and petals similar and sub-equal, elliptic-oblong, vinous purple toned with brown; lateral sepals narrowly oblong, falcate with the inner margin infolded, the margin green, the remaining area vinous purple toned with brown; lip white with a reddish stain at the base of the intermediate lobe, appressed to the column, three-lobed, the side lobes rotund, the front lobe subquadrate, emarginate; crest small, bifid, toothed in front. Column semiterete, white spotted with red; anther hooded; pollinia two.

Batemania Colleyi, Lindl. in *Bot. Reg.* t. 1714 (1835). *Bot. Mag.* t. 3818. Rchb. in Walp, Ann. VI. p. 554. Williams' *Orch. Alb. VIII.* t. 341.

EXCLUDED SPECIES.

Batemania Burtii (Rchb.)	now	referred to	Zygopetalum	Burtii (Benth.)
grandiflora (Batem.) ...	,,	,,	,,	grandiflorum (Benth.)
Wallisii (Hort.) ...	,,	,,	,,	Burtii (Benth.)
Meleagris (Rchb) ...	,,	,,	,,	Meleagris (Benth.)

BIFRENARIA.

Lindl. Gen. et Sp. Orch. p. 152 (1832), and Bot. Reg. 1843, misc. No. 67. Benth. et Hook. Gen. Plant. III. p. 546.

The Bifrenarias are associated with the orchid culture of the past in a much higher degree than with that of the present, and, with the exception of *Bifrenaria Harrisoniæ,* which has to a greater or less extent held its ground for the greater part of a century, they have long since receded before the more brilliant ORCHIDEÆ of the temperate regions of the Andes and southern Brazil. Of the ten described species, seven or eight of them were introduced into European gardens and figured in the botanical serials of the first half of the century, nearly all of them as Maxillarias, to which genus they were originally referred, but afterwards removed by Lindley by reason of the different structure of their pollinary apparatus. This differs from Maxillaria proper in having the pollen masses attached to the gland by a pair of distinct straps or caudicles, instead of one; the generic name from *bi* for *bis,* "twice," and *frenum,* "a strap or bridle," was suggested by this character. Bifrenaria further differs from Maxillaria in the flowers being racemed, not solitary.

The species here noted are still in cultivation; they are natives of the hot damp valleys of Guiana and Brazil, and thence require the cultural treatment usually applied to the occupants of the East Indian house.

Bifrenaria atropurpurea.

Pseudo-bulbs sub-conic, four-angled, 2—3 inches long, much corrugated when old, monophyllous. Leaves oblong-lanceolate, acute, 6—10 inches long. Scapes sheathed at the base with ovate, inflated brown bracts, 3—5 flowered. Flowers 2 inches in diameter when spread out; sepals and petals dull claret-red with a yellowish stain in the centre; the dorsal sepal and petals elliptic-oblong acute; the lateral sepals broader, oblong, keeled behind, adnate to the lip and foot of column at the base, and forming with them a short obtuse spur; lip oblong, incurved at the sides, reflexed and undulated at the apex, bright rose suffused with white; crest a thickish oblong plate obscurely toothed at the front margin. Column short, terete, claret-red; anther white.

Bifrenaria atropurpurea, Lindl. Gen. et Sp. Orch. p. 152 (1832). Id. in Bot. Reg. 1843, misc. p. 52. Rchb. in Walp. Ann. VI. p. 547. Maxillaria atropurpurea, Lodd. *Bot. Cab.* t. 1877.

Introduced by Messrs. Loddiges from Rio de Janeiro in 1828, through their correspondent Mr. Warre, and occasionally imported since with other south Brazilian orchids. It is the species on which the genus was founded, and with the exception of *Bifrenaria Harrisoniæ*, the first Bifrenaria introduced into cultivation. Its chief attraction is the pleasant fragrance of its flowers.

B. aurantiaca.

Pseudo-bulbs ovoid, ribbed and spotted, 1—1½ inch long, monophyllous. Leaves 5—8 inches long, oval-oblong, acute, narrowed below into a short channelled petiole. Scapes longer than the leaves, racemed along the distal half, few-flowered. Flowers an inch in diameter, deep yellow spotted with orange; sepals and petals similar and sub-equal, oblong, undulate, sub-acute; lip clawed, three-lobed, the side lobes roundish oblong, deflexed; the front lobe somewhat fan-shaped with a deep cleft at the apex and with a truncate crest at the base. Column semi-terete, pubescent.

Bifrenaria aurantiaca, Lindl. in *Bot. Reg.* t. 1875 (1836), and 1843, misc. p. 52. *Bot. Mag.* t. 3597. Rchb. in Walp. Ann. VI. p. 550.

A native of British Guiana, whence it was first introduced in 1835, and where it was afterwards detected by the brothers Schomburgk along the banks of the Essequibo and Pomeroon rivers, growing on the stems and branches of trees.

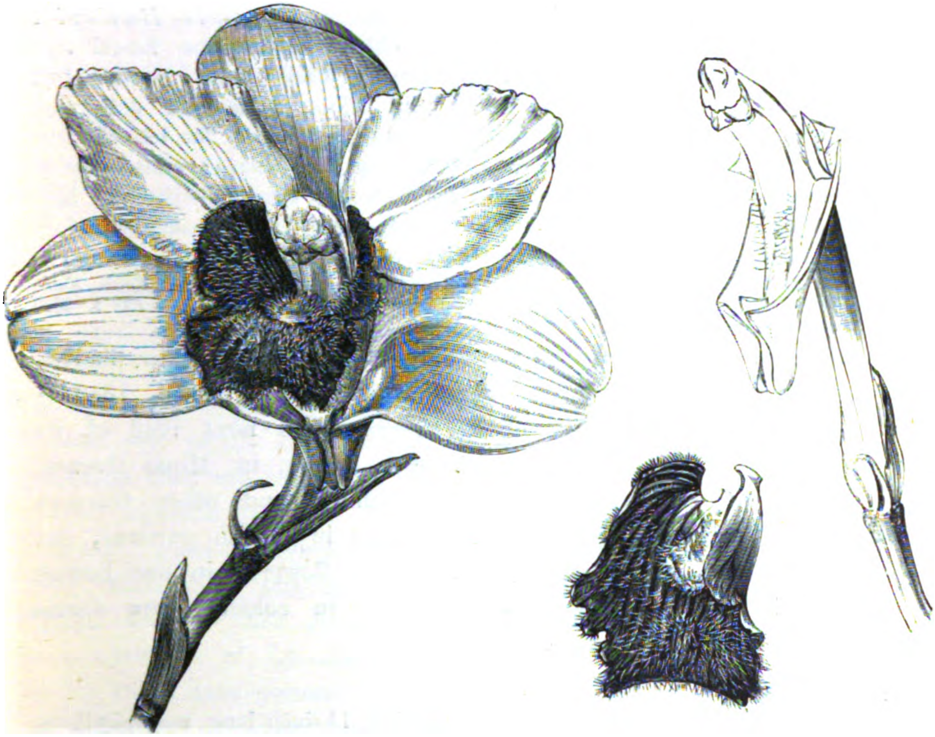
B. Harrisoniæ.

Pseudo-bulbs broadly ovoid, obscurely four-angled, 2—3 inches long, monophyllous. Leaves elliptic-oblong, acute, 9—12 inches long, 3—4 inches broad, leathery and dark green. Scapes shorter than the leaves, usually two from the base of the latest-formed pseudo-bulbs, sheathed with a pale brown, acute bract, about an inch long at each joint, and a larger one at the base of the ovary, 1—2 flowered. Flowers fleshy, about 3 inches across the lateral sepals; sepals and petals spreading, oval-oblong, obtuse, ivory-white; the dorsal sepal concave, the lateral two a little larger, slightly falcate, adnate to the produced foot of the column, and forming with it and the base of the lip a funnel-shaped obtuse spur; lip three-lobed, vinous purple with darker purple veins; the side lobes oblong, incurved, the intermediate lobe sub-quadrate, emarginate, hairy above, the margins much notched; crest very hairy, orange-yellow. Column clavate, arched, white.

Bifrenaria Harrisoniæ, Rchb. in Bonpl. III. p. 217 (1855). Id. Xen. Orch. I. p. 224, t. 94. fig. 2. Id. in Walp. Ann. VI. p. 547. *Lindenia*, *V.* t. 239. Maxillaria Harrisoniæ, Lindl. in *Bot. Reg.* t. 897 (1825). Id. Gen. et Sp. Orch. p. 148. *Bot. Mag.* t. 2927. Paxt. *Fl. Gard. II.* p. 196 (grandiflora). Dendrobium Harrisoniæ, Hook. Exot. Fl. t. 120 (1825). Lycaste Harrisoniæ, Williams' Orch. Manual, p. 579.

sub-vars.—*alba* (Bot. Reg. 1841, misc. No. 68), sepals and petals cream-white with a slight tinge of violet at the apex, lip paler than in the original form; *eburnea* (Williams' *Orch. Alb. III.* t. 100, Lycaste), sepals and petals ivory-white, lip yellow, streaked with red-purple; *purpurascens*, sepals and petals light plum-purple, front lobe of lip dark plum-purple.

The botanical and horticultural history of those orchids that have been longest in cultivation is often the most obscure, because in the early days of orchid culture very little care was taken to ascertain habitats or to record the dates of introduction. *Bifrenaria Harrisoniæ* is an instance of this. All that is recorded respecting its origin is, that it was sent by Mr. William Harrison, a British merchant residing in Rio de Janeiro, to his brother Richard at Liverpool, and that on flowering it was named by Sir William Hooker in compliment to another member of the family, Mrs. Arnold Harrison, the possessor of one of the finest collections of orchids at that time. The probable date of introduction is thence 1821—22. In a note in Walper's *Annales Botanices*, Reichenbach states



Bifrenaria Harrisoniæ.

that it was gathered by Gardner, who found it on moist shady rocks at Praha Vermelha, a locality not found on any map to which we have access.

The sub-varieties noted above are pretty and fairly distinct, especially the last named, which was sent to us by the late Mr. H. J. Buchan, of Wilton House, Southampton.

B. inodora.

Pseudo-bulbs, leaves and inflorescence as in *Bifrenaria Harrisoniæ.* Flowers 3 inches in diameter; sepals oblong, obtuse, the lateral two with a mucro at their apex, apple-green; petals much smaller but brighter in colour, sub-rhomboidal; lip white, yellow or dull rose colour, three-lobed, the side lobes sub-triangular, erect, the intermediate lobe broadly oval, hairy, reflexed, crisped at the margin; crest a fleshy grooved plate toothed and projecting in front; spur sub-cylindric, half as long as the ovary. Column curved, terete above, concave below the stigma, white, sometimes greenish yellow.

Bifrenaria inodora, Lindl. in Bot. Reg. 1843, misc. Nos. 63 and 67. Rchb. *Xen. Orch. I.* p. 223. t. 94. fig. 1. B. aurantiaca, Williams' *Orch. Alb. IX.* t. 386 (not of Lindl.).

"Imported from Rio de Janeiro in 1839, and added to Sir Charles Lemon's collection at Carclew, where it flowered in April, 1843"; such is the earliest account of its origin. We next read of its being gathered by the Belgian collector, Libon, in Minas Geraes, and afterwards cultivated by Consul Schiller and other German amateurs. Quite recently it has reappeared in British gardens, our description being taken from a plant that flowered in our houses in May, 1891. The flowers are variable in colour, some forms being more attractive than others.

B. vitellina.

Pseudo-bulbs clustered, ovoid, four-angled, 1½ inch long, monophyllous. Leaves lanceolate, acute, 9—12 inches long, narrowed below into a short petiole. Scapes shorter than the leaves, crimsonish mottled with pale green, terminating in a lax, few-flowered raceme. Flowers an inch in diameter, orange-yellow with a maroon spot on the lip; sepals and petals oval-oblong, apiculate; the lateral sepals sub-falcate and spreading, the petals smaller and parallel with the column; lip cordate, three-lobed, the side lobes sub-triangular, erect; the intermediate lobe roundish with crisped margin; crest a flat plate thickened in front; spur short, obtuse. Column terete, whitish.

Bifrenaria vitellina, Lindl. in Bot. Reg. 1843, misc. No. 67. Rchb. in Walp. Ann. VI. p. 549. Maxillaria vitellina, Lindl. in *Bot. Reg.* 1839, t. 12. M. barbata, Knowles and Westc. *Fl. Cab. II.* t. 83. Lindl. in Bot Reg. 1841, misc. No. 141.

An attractive species originally imported from Brazil by Messrs. Loddiges, in whose nursery it flowered in June, 1838. As in the case of most of the earliest imported orchids from Rio de Janeiro, no locality was recorded, although it is certain that the plant was gathered at no great distance from that city. We received materials for description from Burford Lodge and from Glasnevin.

EXCLUDED SPECIES.

Bifrenaria Hadwenii (Lindl.), now referred to Scuticaria Hadwenii (Benth.)

PAPHINIA.

Lindl. in Bot. Reg. 1843, misc. p. 14. Rchb. in Walp. Ann. VI. p. 614 (1863).

The type species, like many more of the South American VANDEÆ, was originally described and figured as a Maxillaria. In his revision of that genus in the *Botanical Register* of 1343, Dr. Lindley removed it from Maxillaria on account of the different structure of its pollinary apparatus: in Maxillaria the pair of double pollen masses are sessile or nearly so, on a crescent-shaped gland; in Paphinia they are connected with a small roundish gland by a long slender caudicle (stipes). This is an important difference from a botanical point of view, and justifies the separation of Paphinia from Maxillaria; but in Lycaste we find a similar condition of things, and on that ground chiefly Mr. Bentham reduced Paphinia to a synonym of Lycaste; but here again other characters have to be taken into account by the systematist: in Lycaste the scapes are with one exception* one-flowered, and always erect; in Paphinia they are oftener two or more flowered and pendulous, and the flowers strikingly different in colour; and more important than this is the different form of the labellum in the two genera: in Paphinia this organ, as will be seen from the description of the species that follow, has quite a complex structure; in Lycaste it is comparatively simple. On these grounds we have retained Lindley's genus Paphinia, not only for garden use, but also if merged into Lycaste—itself a very natural genus—the homogeneity of the latter would be greatly impaired.

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* *Lycaste tetragona.*

Four species, all South American, have been figured and described, of which the last introduced is unknown to us.

Cultural Note.—The plants being of small size with a pendulous inflorescence, they are best cultivated in shallow pans near the glass of the East Indian house, care being taken to shade them from too powerful direct sunlight during the summer months. The pans should be filled to about two-thirds of their depth with the usual drainage material, and the remainder with a mixture of sphagnum moss and fibrous peat on which the plants should be placed, not inserted, so that the base of the pseudo-bulbs may be on a level with the rim of the pan. As the Paphinias naturally grow in a very humid atmosphere, constant attention must be given to the supply of water, and also to keeping the plants free from insect pests.

Paphinia cristata.

Pseudo-bulbs clustered, ovate-oblong, 1—1½ inch long, di-triphyllous. Leaves lanceolate, acute, plicate, 7—10 inches long. Peduncles slender, quite pendulous, 1—3 flowered; bracts nearly an inch long, loose, membraneous, brownish. Flowers 3—4 inches in diameter; sepals and petals similar, broadly lanceolate, sub-acuminate, the basal half pale yellow streaked transversely with chocolate-brown, the apical half wholly brown but sometimes streaked longitudinally with pale yellow; lip shorter than the sepals and petals, clawed, the blade fleshy, distinctly bipartite, dark chocolate-purple; the hypochile transversely oblong with the front angles acute, the epichile sub-rhomboidal with a tuft of white hairs at the apex. Crest an oblong raised plate, bidentate at the top, below which are four prominent tubercles. Column semi-terete with a tooth-like auricle on each side of the stigma, yellowish green banded with chocolate towards the base; rostellum beaked.

Paphinia cristata, Lindl. in Bot. Reg. 1843, misc. p. 14. *Bot. Mag.* t. 4836. Van Houtte's *Fl. des Serres, IV.* t. 335. Williams' *Orch. Alb. I.* t. 34. *Lindenia, I.* t. 30 (Randii). Maxillaria cristata, Lindl. in *Bot. Reg.* t. 1811.

sub-var.—Modiglianiana (*Lindenia, III. t.* 117).

Flowers white except the anther which is light yellow.

Paphinia cristata is the type species, and the only one that was known for many years till the discovery of *P. rugosa* and *P. grandiflora* in 1876. It was first cultivated in this country in 1836 by Mr. Knight, our predecessor at the Royal Exotic Nursery, who had received it from Trinidad. A few years later it was detected by the brothers Schomburgk on the banks of the Kamwatta river, in British Guiana, growing on the trunks of trees; and subsequently by Purdie in northern Colombia, by whom it was sent to the Royal Gardens at Kew. The sub-variety, a very beautiful and distinct one, was recently introduced by L'Horticulture Internationale of Brussels.

P. grandiflora.

Pseudo-bulbs broadly ovoid or sub-globose, about an inch in diameter, diphyllous. Leaves broadly lanceolate, acuminate, 7—10 inches long. Scapes short, pendent, 2—3 flowered. Flowers the largest in the genus; dorsal sepal 3 inches long, ovate-lanceolate, acute, the basal half yellowish white with numerous irregular transverse chocolate-purple bands, the apical half wholly chocolate-purple sometimes with a narrow yellowish white margin; lateral sepals similar but sub-falcate; petals similar to the sepals but more narrowed towards the base; lip clawed, distinctly bipartite, the claw blackish purple; the hypochile obovate-oblong, yellowish white with two incurved linear light brown auricles; the epichile with a narrow claw having two dark purple falcate teeth at the base of the sub-orbicular fleshy blade that is covered with whitish shaggy hairs. Column greenish, spotted with purple.

Paphinia grandiflora, Rodr. Gen. et Sp. Orch. nov. I. p. 124 (1877). P. nutans, Houll. in Rev. Hort. 1878, p. 188 (ex descript.). P. grandis, Rchb. ex Williams' *Orch. Alb. IV.* t. 145.

A very remarkable orchid, and the handsomest species in the genus; the colour of the perianth segments is rich and effective, and contrasts strongly with the small pale labellum which, as our description shows, is of very complex structure. It first became known to science in 1877 through the Brazilian botanist, Rodriguez; it first appeared in British gardens in 1883, flowering in the autumn of that year.

P. rugosa.

Pseudo-bulbs smooth, ovoid, elongated, 1½ inch long, diphyllous. Leaves linear-lanceolate, acuminate, 4—6 inches long. Scapes short, pendent, with an appressed bract at the base of the ovaries, 2—3 flowered. Flowers 2—3 inches in diameter; sepals lanceolate, acuminate, light yellow dotted with red; lip clawed, the hypochile crescent-shaped with two sub-falcate, erect auricles, red-purple; the epichile also red-purple, sub-rhomboidal, reflexed, with two broad auricles and a dense tuft of white bristles at the apex. Column clavate, bent, greenish yellow, with a narrow rounded wing on each side of the stigma.

Paphinia rugosa, Rchb. in Linnæa, XLI. p. 110 (1877). Id. in Gard. Chron. XII. (1879), p. 520; and XIV. (1880), pp. 102 and 778. Sander's *Reichenbachia*, s. 2, vol. I. t. 11.

One of the discoveries of Gustav Wallis in New Granada in 1876, and shortly afterwards gathered by Franz Klaboch. Three years later it was introduced into British gardens by Messrs. Sander and Co. through Chesterton, and it flowered for the first time in this country in the collection of Sir Trevor Lawrence, Bart., at Burford Lodge, in the summer of 1880. About the same time we received a small consignment through Kalbreyer. Neither of these collectors divulged its precise habitat; it is reported to be a rare plant, confined to a small area, and growing upon high trees in dense shade.

LYCASTE.

Lindl. in Bot. Reg. 1843, misc. p. 14. Benth. et Hook. Gen. Plant. III. p. 547.

Lycaste, a very natural genus not often confused with any other, includes about twenty-five species; but with one notable exception (*Lycaste Skinneri*) not many of them have hitherto found much favour with cultivators of orchids. This want of appreciation has probably arisen from the fact that the flowers of many of the species, although of large size and even of stately aspect, are often of homely or pallid colours that fail to attract favour. But among those species with smaller flowers there are some that possess pleasing although by no means brilliant colours, and in addition, some of them have a pleasant fragrance; they are thence represented in many collections. It may be observed, as a fair index of the favour accorded to the Lycastes, that very few of them, with the exception of *L. Skinneri*, have been figured in the horticultural serials devoted to the illustrations of orchids.

The essential characters of the genus may be thus formulated:—

> The *sepals* are sub-equal and spreading, the lateral two adnate at their base to the foot of the column, and forming with it a short *mentum* or chin.
>
> The *petals* are similar to the sepals in shape, but often much smaller and parallel with the column, rarely spreading.
>
> The *lip* is affixed to the foot of the column; it is either sessile or shortly clawed, three-lobed, with the lateral lobes erect and the terminal one reflexed, and ciliolate or fimbriate at the margin, but sometimes entire; on the disk between the side lobes is a fleshy, grooved plate.*

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* The form and size of this plate affords in several instances a good character for the determination of the species;—thus, in *Lycaste Linguella* it is excessively developed, forming a semi-cylindric tube; in *L. lasioglossa* it is reduced to a small tongue-shaped callosity; while in *L. Skinneri* it is well-nigh intermediate between those two.

The pollinia are four in two pairs, attached to the small gland by a long slender caudicle (stipes).

In their vegetation the Lycastes are remarkably uniform, so much so that the following general description of the pseudo-bulbs, leaves and inflorescence applies to all the species in the following synopsis:—

The *pseudo-bulbs* are of ovoid form more or less furrowed, with rounded ribs or obscurely angulate, and bearing at their apex 1—3 leaves that are sub-evergreen, rarely persisting more than twelve months, often much less.

The *leaves* are of oblong-lanceolate or elliptic-lanceolate form, more or less acuminated, with about five pale nerves and plaited; they are always narrowed below into a channelled foot-stalk.

The *scapes* arise from the base of the latest-formed pseudo-bulbs, and are, except in one species, one-flowered; they have from two to four joints with a membraneous brown sheath at each joint, and a similar but larger bract at the base of the ovary.*

The geographical distribution of the Lycastes is nearly conterminous with that of the Odontoglots with the exception of one outlying member in southern Brazil. They occur on the Cordilleras of tropical America from Mexico to Bolivia, but their vertical range is generally lower than that of the Odontoglots. Like the Odontoglots, too, the species are somewhat aggregated towards the northern limit, becoming fewer and more dispersed till the southern limit is reached. All the Andean Lycastes occur within the region coloured light brown on the maps illustrating the distribution of Odontoglossum.

Cultural Note.—The climatic conditions under which the Andean Lycastes grow are fully stated in the notes on the geographical distribution of Odontoglossum and Cattleya.† The Lycastes of Mexico, Central America and Colombia, generally speaking, occur within the higher range of the Cattleyas and the lower range of the Odontoglots; as regards temperature therefore, they occupy a mean position between the two, and as regards humidity they live in a region in which there is nominally a dry season of three or four months only. The climate of the zone within which they are found on the Andes of Peru is not, so far as known, essentially different from that of their range in Colombia. The cultural routine is a very simple one:—The plants should have ample pot room as they root freely; a compost of rough fibrous peat and sphagnum moss with a drainage of broken crocks to three-fourths of the depth of the pot is found to be the most suitable, and upon this the plants should be placed with the base of the pseudo-bulbs about on a level with the rim of the pot. Water should be freely supplied during the growing season, and even when the plants are at rest the compost should at no time be allowed to become dry. Light shading should be used during bright days in summer, but at other times the plants should receive as much light as possible.

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* The number of scapes produced from one pseudo-bulb varies considerably in the different species and even in the same species. We have observed instances in which from 15 to 20 flowers have been produced from a single pseudo-bulb.

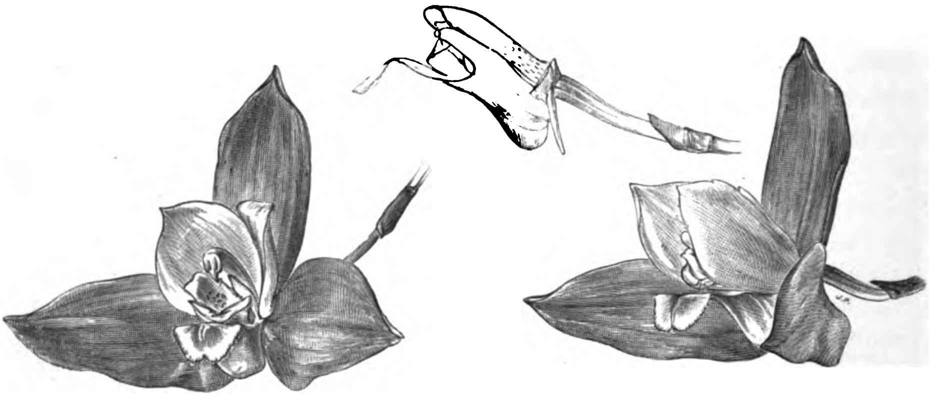
† Odontoglossum, p. 9; and Cattleya, p. 6.

Lycaste Skinneri may be grown in the cool house so long as the temperature does not sink below 10° C. (50° F.). Red spider sometimes attacks the leaves on the under side which causes them to turn yellow; when they are detected the leaves should be sponged with a weak insecticide.

SYNOPSIS OF SPECIES AND VARIETIES.

Lycaste aromatica.

Pseudo-bulbs 1½—2½ inches long, dark dull green, mono-diphyllous. Leaves 7—10 inches long. Scapes slender, 4—6 inches long. Flowers with a strong aromatic fragrance, about 1½ inch across the lateral sepals; sepals ovate-oblong, acute, fulvous yellow; petals similar, bright orange-yellow; lip three-lobed, the side lobes oblong, free at the apical end, incurved over the column, orange-yellow spotted with red; the intermediate lobe oblong, obtuse, reflexed, coloured like the petals; plate of disk grooved, thickened and truncate at the apex. Column slender, semi-terete, slightly bent, pubescent below the stigma.



Lycaste aromatica.

Lycaste aromatica, Lindl. in Bot. Reg. 1842, misc. p. 16. Rchb. in Walp. Ann. VI. p. 600. Maxillaria aromatica, Hook. Exot. Flora, t. 219 (1823). Lindl, Gen, et Sp. Orch. p. 146. *Bot. Reg.* t. 1871.

First sent by Lord Napier from Mexico to the Botanic Garden at Edinburgh some time previous to the year 1826; it is therefore an old denizen of British gardens, in which its pleasant fragrance has always secured for it a place; its Mexican habitat does not appear to have been recorded. In the miscellaneous matter of the *Botanical Register* of 1844, p. 41, Dr. Lindley mentions a variety "with very clear yolk-of-egg yellow flowers, and the middle lobe of the lip dilated and almost two-lobed," said to have been received from Lima by Mr. Barker, of Birmingham, but which seems to have been since lost.

L. candida.

Pseudo-bulbs 1½—2½ inches long. Leaves 9—12 inches long. Scapes one-third as long as the leaves. Flowers about 2 inches in diameter; sepals oval-oblong, acute, reflexed at the tip, pale green sometimes freckled or spotted with light rose; petals smaller, whitish more or less tinted with light rose; lip obovate-oblong, obscurely three-lobed, of a purer white than the petals, and with a few rose-purple spots; plate of disk thin, oblong, thickened and emarginate at the apex. Column slender, terete, bent towards the apex, hairy below the stigma, white spotted with rose.

Lycaste candida, Lindl. in Paxt. Fl. Gard. II. p. 37, icon. xyl. (1852). Rchb. in Walp. Ann. VI. p. 604. L. Lawrenceana, Hort.

One of the dwarfest species in the genus. It was discovered by Warscewicz in Central America in 1849—50, and introduced by him shortly afterwards. Horticulturists distinguish the sub-variety, in which all the floral segments are more or less tinted with rose, by the name of *Lycaste Lawrenceana*.

L. ciliata.

Pseudo-bulbs 2—3 inches long, diphyllous. Leaves 7—10 inches long. Scapes a little longer than the pseudo-bulbs. Sepals and petals green, ovate-lanceolate, the lateral sepals sub-falcate, the petals smaller than the sepals; lip oblong, three-lobed, the side lobes erect, white; the terminal lobe fringed, with a larger concavity at its base and a smaller one at its apex, pale buff-yellow; plate of the disk rather broad, grooved, with three raised lines in the concavity. Column trigonal, arched, white.

Lycaste ciliata, supra, not of Rchb.* Maxillaria ciliata, Ruiz et Pav. Fl. Peruv. p. 226; and Syst. Veg. p. 221 (1798). *Bot. Reg.* t. 1206. *Bot. Mag.* t. 4081. Dendrobium ciliatum, Pers. Syst. Pl. p. 523 (1805).

Materials for description, under the name of *Lycaste Barringtoniæ*, were sent to us from the Royal Botanic Garden at Glasnevin by Mr. F. W. Moore, who called our attention to the confusion that has long existed respecting this species. On comparing the flowers with the figures of *Maxillaria ciliata* in the *Botanical Register* and *Botanical Magazine,* we were satisfied that the Glasnevin plant must be referred to that species. Now Lindley (Bot. Reg. 1844, misc. p. 43) reduced *M. ciliata* to a synonym of *M. Barringtoniæ* of Loddiges,* when he removed the latter to Lycaste; this is a West Indian species figured and described in Hooker's *Exotic Flora* as *Dendrobium Barringtoniæ,* and in Smith's *Icones* as *Epidendrum Barringtoniæ.* Unfortunately both Loddiges' and Hooker's figures are imperfect, but there is sufficient evidence in them to raise a doubt whether the Peruvian *Lycaste ciliata* and the West Indian *L. Barringtoniæ* are one and the same species, a doubt that we are unable to clear up. It is scarcely necessary to add that the plant figured as *L. Barringtoniæ* in the *Botanical Magazine,* t. 5706, is not the West Indian species but the Peruvian *L. costata.*

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* Bonpl. IV. p. 324; and Walp. Ann. VI. p. 606.

Lycaste ciliata was first gathered by the Spanish botanists, Ruiz and Pavon, at Muña and Chinchao, in Peru, more than a century ago. The plant is of no horticultural merit whatever; it is introduced here solely with the view of bringing under notice the confusion that exists respecting it.

L. costata.

Pseudo-bulbs 3—5 inches long, compressed with 3—5 strong ribs in each of the flattened sides, diphyllous. Leaves 20—25 inches long including the rather long channelled petiole. Scapes about one-fourth as long as the leaves; bracts large and slightly inflated. Flowers 4 inches across vertically, ivory-white; dorsal sepal oblong, acute, incurved over the column; lateral sepals oblong, falcate, sub-acute; petals linear-oblong, sub-acute, lying immediately under the dorsal sepal and incurved over the column in the same way; lip three-lobed, the side lobes sub-rhomboidal with the front angle very acute; the intermediate lobe ovate-oblong with the side margins fimbriate; plate of disk very thick, grooved and emarginate. Column triquetral, bent, hairy at the base.

Lycaste costata, Lindl. in Bot. Reg. 1843, misc. p. 15. Id. in Gard. Chron. 1854, p. 663. Rchb. in Walp. Ann. VI. p. 605. Regel's *Gartenfl.* 1869, t. 620, and 1885, t. 1141. Williams' *Orch. Alb. VIII.* t. 384. *Lindenia V.* t. 220. Lycaste Barringtoniæ, *Bot. Mag.* t. 5706 (grandiflora). Maxillaria costata, Lindl. in Bot. Reg. 1838, misc. p. 93.

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* Bot. Cab. t. 1834.

Originally detected in 1838 on the Peruvian Andes by Matthews, from whose herbarium specimen it was first named and described. It was introduced in 1851 by the late Mr. Robert Hanbury, of The Poles, near Ware. *Lycaste costata* is well known for the imposing dimensions it attains and for its large flowers that are pleasantly fragrant at night; it has been occasionally confused with *L. Barringtoniæ* and *L. lanipes*, the latter having much smaller flowers with a differently-shaped lip.

L. cruenta.

Pseudo-bulbs 1½—2½ inches long, compressed with 2—3 ribs on each of the flattened sides, diphyllous. Leaves 15—18 inches long. Scapes about 6 inches long. Flowers 2½ inches across the lateral sepals; sepals spreading, ovate-oblong, acute, light fulvous green; petals oval-oblong, orange-yellow spotted with red at the base; lip three-lobed, the side lobes rounded and erect, the intermediate lobe sub-quadrate and reflexed, blood-red at the base, the remaining area orange-yellow sometimes with some red transverse streaks; plate of disk short, thickened and truncate in front. Column broad, terete, orange-yellow above, crimson and hairy below the stigma.

Lycaste cruenta, Lindl. in Bot. Reg. 1843, misc. p. 15. Rchb. in Walp. Ann. VI. p. 601. Williams' *Orch. Alb. VIII.* t. 375. Maxillaria cruenta, Lindl. in *Bot. Reg.* 1842, t. 13.

One of the discoveries of Mr. G. Ure Skinner in Guatemala and sent by him to Mr. Bateman in 1841; it also occurs sparingly on the eastern Cordillera of Colombia some miles south of Ocaña. It is one of the most generally cultivated of the Lycastes, much resembling *Lycaste aromatica,* from which it is chiefly distinguished by its larger scentless flowers, of which the labellum is of a different shape and has a dark sanguineous blotch at the base, a character that suggested the specific name.

L. Deppei.

Pseudo-bulbs 2½—3½ inches long, compressed and strongly ribbed on the flattened sides, and bearing at their apex 3—4 leaves. Leaves 9—12 or more inches long. Scapes numerous, shorter than the leaves. Flowers 3—4 inches across the lateral sepals; sepals spreading, elliptic-oblong, acute, pale green spotted with reddish carmine; petals similar but shorter, ivory-white; lip three-lobed, the side lobes oblong, incurved, whitish streaked with red on the inner side; the intermediate lobe ovate, acute, reflexed, bright yellow spotted with red; plate of disk ovate at apex passing into a broad keel below. Column clavate, hairy on the anterior face, white spotted with red.

Lycaste Deppei, Lindl. in Bot. Reg. 1843, misc. p. 15. Rchb. in Walp. Ann. VI. p. 602. Maxillaria Deppei, Lodd. *Bot. Cab.* t. 1612 (1830). *Bot. Mag.* t. 3395. Lindl. Gen. et Sp. Orch. p. 147.

var.—punctatissima.

Sepals longer and narrower than in the type, yellow-green densely spotted with reddish carmine, the white petals and yellow lip also spotted with red-carmine, the spots on the petals more dispersed, and those on the lip larger than on the sepals.

L. Deppei punctatissima, Rchb. in Gard. Chron. XVI. (1881), p. 717. Williams' *Orch. Alb. VI.* t. 262.

A very old denizen of British gardens, it having been introduced by Messrs. Loddiges in 1828 through Deppe, who collected it near Xalapa in Mexico. It flowered in Earl Fitzwilliam's collection at Wentworth, near Sheffield, in 1834, on which occasion it was figured in the *Botanical Magazine*, but it seems to have been very rare for some time afterwards. The variety, a very remarkable one, was introduced by the late Mr. B. S. Williams, of Holloway; the only plant we have seen of it is in the collection of Sir Trevor Lawrence, Bart., at Burford Lodge.

L. fulvescens.

Pseudo-bulbs variable in size, the largest 4—5 inches long and 1½—2 inches broad, diphyllous. Leaves 15—20 inches long. Scapes as long again as the pseudo-bulbs. Flowers large and drooping; sepals and petals lanceolate, acuminate, fulvous-brown, much paler at the base, the sepals nearly 3 inches long, the lateral two sub-falcate, the petals much smaller; lip oblong, obtuse, three-lobed, orange-brown, the front lobe fringed at the margin; plate of disk grooved, thickened and emarginate at the apex. Column semi-terete, whitish.

Lycaste fulvescens, Hook. in *Bot. Mag.* t. 4193 (1845). Lindl. Orch. Lind. No. 108, p. 21 (1846). Rchb. in. Walp. Ann. VI. p. 605.

Discovered by Linden in 1842 on the eastern Cordillera of New Granada at 6,000 feet elevation, near Ocaña, and subsequently gathered by Schlim and Wagener in the same region; it occurs on the Cordillera from Ocaña southwards as far as Bogota. It was first cultivated in this country by the Rev. John Clowes, of Broughton Hall, Manchester, in whose collection it flowered in 1845. The peculiar drooping habit of the flowers and their unusual colouration well distinguish this species among Lycastes.

L. gigantea.

Pseudo-bulbs 4—5 inches long and 1½ inch broad, di-triphyllous. Leaves 20—30 inches long with rather long foot-stalks. Scapes stoutish, shorter than the leaves. Flowers large with the segments turned more or less forwards; sepals lanceolate, acute, 5 inches long, olive-green, the lateral two sub-falcate; the petals similar but smaller; lip oblong, maroon-chocolate bordered with orange-yellow, three-lobed, the side lobes narrow, erect, the intermediate lobe reflexed; plate of disk somewhat saddle-shaped, much thickened, and emarginate at the apex. Column triquetral, bent, whitish.

Lycaste gigantea, Lindl. in *Bot. Reg.* 1843, misc. p. 15; and 1845, t. 34. *Bot. Mag.* t. 5616. Rchb. in Walp. Ann. VI. p. 604. Williams' *Orch. Alb. IX.* t. 408.

Originally discovered by Hartweg in 1842 in Ecuador at a place called Quebrada de las Juntas, near Guayaquil, and sent by him to the Horticultural Society of London, in whose garden at Chiswick it flowered in 1845; it had, however, previously flowered in Belgium, whither it had been introduced from La Guayra, probably through Linden.* It was subsequently gathered by Wagener on the Cordillera of Venezuela, by Purdie in Santa Martha, and by other collectors on the eastern Cordillera of Colombia as far south as Bogota, always at a considerable elevation. Its nearest affinity is *Lycaste fulvescens*, with which it is in some localities found associated and with which it agrees in its elongated sepals and petals, the latter of which are more spreading in these species than in any other Lycaste in cultivation.

L. lanipes.

Pseudo-bulbs sub-cylindric, elongated, 5—6 inches long, di-triphyllous. Leaves 20—25 inches long, the petiole about one-third the length of the blade. Scapes 3—4 inches long. Flowers 4 inches across vertically; sepals oblong-lanceolate, greenish white; petals similar but shorter, ivory-white; lip ivory-white, oblong, slightly constricted at the middle, reflexed at the apex, the margins of the basal half entire, of the apical half fimbriated; plate of disk dilated at the apex and with 3—5 parallel raised lines. Column semi-terete, arched.

Lycaste lanipes, Lindl. in Bot. Reg. 1843, misc. p. 15. Rchb. in Walp. Ann. VI. p. 606. L. Cobbiana, Hort.

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* The plants must have been shipped at La Guayra, not gathered there. La Guayra is the port of Caracas, and is more than 1,200 miles distant from Guayaquil in Ecuador. As *Lycaste gigantea* is known to be dispersed over the Cordilleras of Colombia for many hundreds of miles, Lindley's statement in the *Botanical Register* respecting its Ecuadorean habitat may be assumed to be correct.

Discovered by Hartweg at Paccha, on the Peruvian Andes near Loxa, in 1842, and sent by him to the Horticultural Society of London. Ten years later it was collected by Warscewicz in the same locality, and it has been occasionally imported since. It is well distinguished by its elongated pseudo-bulbs, its narrow leaves, and the keeled plate of the labellum.

L. lasioglossa.

Pseudo-bulbs 4—5 inches long and 1½—2 inches broad, di-triphyllous. Leaves variable in size and form, from elliptic to oblong-lanceolate, 15—24 inches long. Scapes 6—8 inches long, stoutish. Flowers 4—5 inches across vertically; sepals spreading and equidistant, lanceolate-oblong, acute, reddish brown, yellow at the tip, hairy at the base; petals oblong, concave, reflexed at the apex, bright yellow; lip yellow, three-lobed, the side lobes narrow, stained with red on the inner side; the terminal lobe oblong, obtuse, clothed with long white hairs on the upper surface; plate of disk tongue-shaped. Column terete, light yellow above, hairy below the stigma.

Lycaste lasioglossa, Rchb. in Gard. Chron. 1872, p. 215. *Bot. Mag.* t. 6251. *Lindenia, VII.* t. 316.

Introduced by us from Guatemala in 1871. Although its large flowers are of somewhat homely colours, it is one of the most interesting species of the genus, its shaggy lip being quite singular in that respect, and imitating the Paphinias; it also suggested the specific name which is derived from λάσιος, "hairy or rough," and γλῶσσα, "a tongue," in orchidology, the labellum.

L. leucantha.

Pseudo-bulbs 2—3 inches long, di-triphyllous. Leaves 20—25 inches long. Scapes about one-third as long as the leaves. Flowers 3—4 inches across the lateral sepals; sepals oblong, sub-acute, brownish green; petals similar but shorter, reflexed at the apex, yellowish white; lip three-lobed, the side lobes roundish oblong, erect, light yellow; the intermediate lobe ovate-oblong, obtuse, denticulate at the margin, gently reflexed, cream-white; plate of disk narrow, grooved. Column semi-terete, bent, yellowish white.

Lycaste leucantha, Klotzsch in Allgem. Gartenz. 1850, p. 402. Lindl. in Paxt. Fl. Gard. II. p. 37, with fig. Rchb. in Walp. Ann. VI. p. 603. Saunders' *Ref. Bot. II.* t. 102.

Discovered by Warscewicz in Costa Rica in 1849, and occasionally imported since from that country. The colours of its flowers are pallid and unattractive.

L. Linguella.

"Pseudo-bulbs narrowly ovoid, 3 inches long. Leaves 12—15 inches long. Scapes about one-third as long as the leaves; bracts sheathing, green, obovate-oblong, an inch long. Flowers 3 inches across from the tip of the upper to that of the lateral sepals, pale yellowish green; dorsal sepal obovate-oblong, obtusely apiculate; the lateral two larger and falcately curved; petals smaller, broadly obovate, concave; lip whitish, three-lobed, the lateral lobes narrow, the terminal lobe broadly ovate, obtuse, recurved; plate of disk a semi-cylindric tube protruded in front. Column semi-terete, pubescent towards the base."—*Botanical Magazine.*

Lycaste Linguella, Rchb. in Gard. Chron. 1871, p. 738. *Bot. Mag.* t. 6303.

Introduced by us from the Andes of Peru in 1871 through Pearce. It is more remarkable for the unusual development of the fleshy plate of the labellum than for any other character, but which thoroughly distinguishes it from every other species yet introduced.

L. Macrobulbon.

Pseudo-bulbs somewhat pear-shaped, 3 inches long. Leaves 15—20 inches long. Scapes slender, scarcely half as long as the leaves. Flowers fragrant, 3 inches across the lateral sepals; sepals ovate-oblong, acute, greenish yellow; petals similar but smaller, and reflexed at the tip, bright yellow; lip bright yellow, sometimes with some red spots on the terminal lobe, oblong, obtuse, obscurely three-lobed, the side lobes turned inwards, the front lobe reflexed; plate of disk narrow, with a shallow groove, acute at the apex. Column triquetral, bent, yellow with some red spots at the base.

Lycaste Macrobulbon, Lindl. in Paxt. Fl. Gard. I. p. 126 (1851). Rchb. in Walp. Ann. I. p. 601. Maxillaria Macrobulbon, Hook. *Bot. Mag.* t. 4228 (1846).

Introduced to the Royal Gardens at Kew in 1844 by Purdie, who collected it on the Sierra Nevada of Santa Martha in northern Colombia; it was shortly afterwards imported by M. Linden from the same region. It has been recently re-imported and exhibited at the Royal Horticultural Society's meetings under various names, with which it is not desirable to burden the synonymy. It is one of the handsomest of the yellow Lycastes, easily distinguished from *L. aromatica* and *L. cruenta* by its larger pseudobulbs and its differently-shaped lip, the plate of which is long, narrow and pointed, not thickened and truncate at the apex.

L. plana.

Pseudo-bulbs 2½—3½ inches long, di-triphyllous. Leaves 18—24 inches long. Scapes about as long again as the pseudo-bulbs Flowers 4 inches across the lateral sepals; sepals oblong, acute, olive-green tinged with brown, pale green at the reflexed apex; petals elliptic-oblong, reflexed at the apex, white, the central area sometimes spotted with rose-carmine; lip oblong, obtuse, three-lobed, the side lobes erect, whitish at the base, mottled with rose-carmine at the apex; the intermediate lobe with denticulate margin, ivory-white with a few crimson spots near the lateral margins, rarely wholly crimson; plate of disk tongue-shaped, narrowed towards the base. Column semi-terete, pubescent, white.

Lycaste plana, Lindl. in *Bot. Reg.* 1842, p. 85; 1843, t. 35; and misc. p. 15. Williams' *Orch. Alb. V.* t. 230. L. macrophylla, Lindl. in Bot. Reg. 1843, misc. p. 14. Rchb. in Walp. Ann. VI. p. 602. Maxillaria macrophylla, Pöppig et Endl. nov. Gen. et Sp. I. t. 64. ex Lindl. in Bot. Reg. 1838, misc. p. 92.

sub-var.—*Mr. Measures'* (Williams' *Orch. Alb. VII.* t. 306), sepals olive-brown, green at the apex; petals densely spotted with carmine-purple with a narrow white border; lip similarly spotted except the apical area.

Originally discovered by the German botanist, Pöppig, always growing on the ground in thickets near Cuchero, in the trans-Andean parts of Upper Peru (now Bolivia), and subsequently gathered on the Peruvian Andes, where it appears to have a considerable range. It was first imported by Messrs. Loddiges, in whose nursery it flowered in 1842. The sub-variety, which differs from the species in colour only, is a very distinct and rare one; the only plant of it known to us is in the collection of Mr. R. H. Measures, at The Woodlands, Streatham.

L. Schilleriana.

Pseudo-bulbs 4—5 inches long, diphyllous. Leaves 20—25 or more inches long. Scapes about a foot long. Sepals ligulate acuminate, 3 inches long, pale olive-green; petals oblong, acute, half as long as the sepals, ivory-white; lip as long as the petals and nearly equal to them, three-lobed, the side lobes narrowly oblong, erect, yellowish; the intermediate lobe oblong, obtuse, minutely denticulate, ivory-white; plate of disk as long as the side lobes, narrow, grooved. Column semi-terete, hairy below the stigma.

Lycaste Schilleriana, Rchb. in Bonpl. III. p. 215 (1855). Id. in Walp. Ann. VI. p. 604. Saunders' *Ref. Bot. II.* t. 130. Regel's *Gartenfl.* 1890, t. 1321, var. Lehmanni.

The precise habitat of this species is not certainly known. It first became known to horticulture through a plant that flowered in Consul Schiller's collection at Hamburg in 1854, and this plant had been acquired at an English sale by Mr. G. Ure Skinner. This was the only one known for many years till about 1880, when specimens were sent by various correspondents to the late Professor Reichenbach for identification, and which were supposed to have been imported from New Granada, a supposition since confirmed by plants being received from that country from various orchid collectors. The flowers of *Lycaste Schilleriana* are among the largest in the genus, but they are of dull and unattractive colours.*

L. Skinneri.

Pseudo-bulbs 2½—3 inches long, di-triphyllous. Leaves 15—20 or more inches long. Scapes from one-third to one half as long as the leaves. Flowers the handsomest and largest in the genus, 5—6 inches across the lateral sepals; sepals oval-oblong, sub-acute, reflexed at the tip, the dorsal sepal with a small green apiculus, delicate light rose more or less suffused with white; petals similar but much smaller and more deeply coloured; lip ovate in outline, distinctly three-lobed, rose and crimson-carmine of many shades, often mottled and spotted in various ways with white, rarely wholly white; the side lobes roundish, oblong, erect; the terminal lobe ovate, obtuse, reflexed; plate of disk tongue-shaped, hairy. Column triquetral, hairy below the stigma, white stained with crimson.

Lycaste Skinneri, Lindl. in Bot. Reg. 1843, misc. p. 15. *Bot. Mag.* t. 4445. Van Houtte's *Fl. des Serres, IV.* t. 303. Paxt. *Mag. Bot. XI.* p. I. Linden's *Pesc.* t. 39. *Fl. and Pomol.* 1861, p. 65. *Fl. Mag.* t. 192. Jennings' *Orch.* t. 9. *The Garden, XXV.* (1884), t. 440. Maxillaria Skinneri, Lindl. in Bot. Reg. 1842, misc. No. 13. Batem. *Orch. Mex. et Guat.* t. 35.

sub-vars.—*alba* (Linden's *Pesc*, t. 39, fig. 2. Jennings' *Orch.* t. 9, fig. 2. *Fl. Mag.* N.S. t. 35, fig. 1. Williams' *Orch. Alb V.* t. 234. *Lindenia, IV.* t. 153), flowers white, with the crest of the lip light yellow; *armeniaca* (Sander's *Reichenbachia*, s. 2, t. 18), sepals white, petals and lip suffused with apricot-yellow; *bella*, sepals white tinted with rose-carmine towards the base, petals rose-carmine mottled with white, lip dark crimson margined with white; *delicatissima* (Warner's *Sel. Orch. I.* t. 10, fig. 1), sepals and petals white tinted with light rose, lip white sparingly spotted with rose; *Mr. Young's*, sepals and petals faintly tinted with light rose, lip rose-carmine darker at the lateral margins; *nigro-rubra* (*Fl. Mag.* N.S. t. 35, fig. 2. *Reginæ*, Williams' *Orch. Alb. VI.* t. 283), sepals tinted with rose-carmine, petals purplish crimson, lip maroon-crimson; *picturata* (Warner's *Sel. Orch. I.* t. 10, fig. 2), sepals and petals light rose, lip white stained with crimson at the base, the front lobe spotted with crimson; *purpurata* (Warner's *Sel. Orch. I.* t. 10, fig. 3), sepals and petals white faintly tinted with white rose, lip crimson-purple; *superba* (*Fl. Mag.* t. 24), sepals white with a faint flush of light rose, petals dark carmine, lip white with yellow crest.

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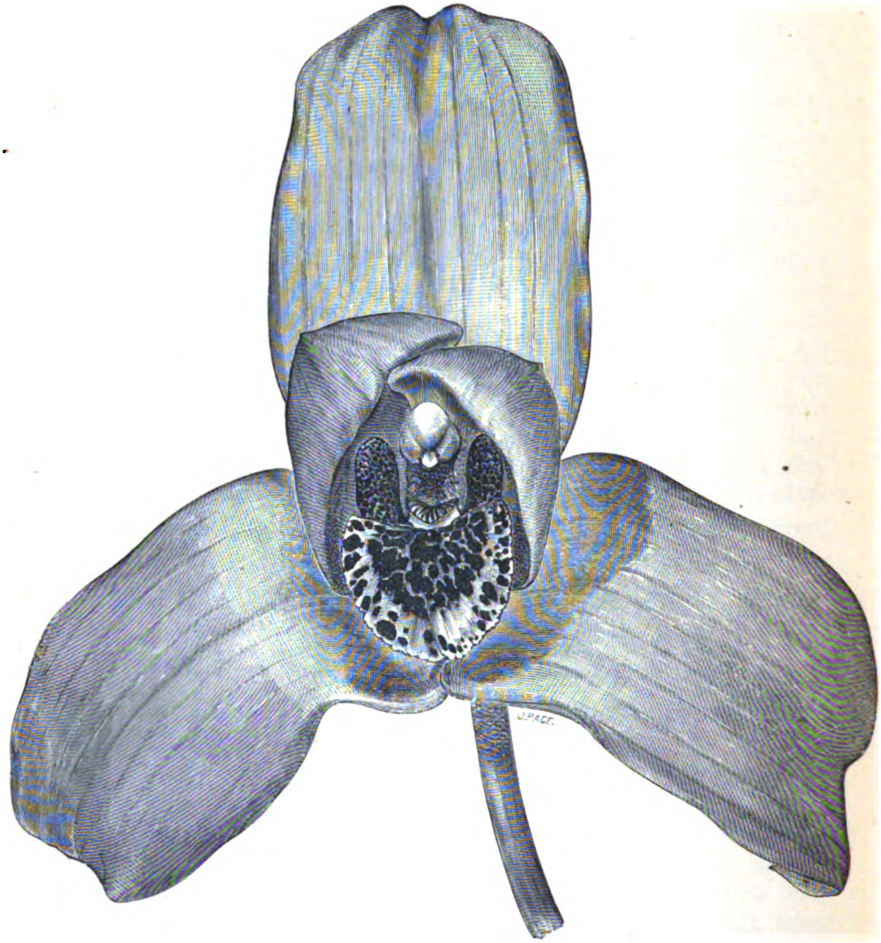
* The variety *Lehmanni* as figured in the *Gartenflora* appears to be an improvement in this respect.



Lycaste Skinneri.

Unquestionably the finest of the discoveries of Mr. G. Ure Skinner in Guatemala, who brought it to England in great numbers in 1841.* It flowered for the first time in this country in the

* In *Pescatorea*, sub. t. 39, the merit of introducing *Lycaste Skinneri* into European gardens is claimed by M. Linden. Mr. Bateman's first announcement of the species appeared in the *Botanical Register* of 1842; *Pescatorea* was published at Brussels in 1860. The claim of prior discovery and introduction by Linden was thence brought forward too late, and on that ground alone cannot be seriously entertained.

collection of the Rev. John Clowes, at Broughton Hall, Manchester, in the following year, and shortly afterwards in other places, when its great merit as a garden plant became generally recognised. Judging from the numerous importations that have been made from Guatemala and the adjoining State of Honduras, it must exist in immense quantities in those countries. Like most orchids that have been introduced in large numbers, the flowers of *Lycaste Skinneri* have proved to be variable in colour, especially in the labellum; the sub-varieties described above are among the most distinct that have been noticed, of which the pure white form (*alba*) has always been in high repute.

Lycaste Skinneri is one of the easiest of orchids to cultivate, requiring only a temperature that does not sink below 10° C. (50° F.). It flowers in the late autumn and winter months, continuing a long time in perfection.

L. tetragona.

Pseudo-bulbs ovoid, elongated, acutely four-angled, 3—4 inches long, monophyllous. Leaves 12—18 inches long. Scapes as long as the pseudo-bulbs, 3—4 flowered; cauline bracts reduced to small ovate, acute scale-like appendages; floral bracts similar but larger. Flowers with a peculiar fragrance, not fully expanding; sepals and petals light yellow-green streaked with red-brown, broadly ovate, acute, the petals narrower and the lateral sepals broader than the dorsal sepal; lip fleshy, three-lobed; the side lobes sub-quadrate, incurved; the intermediate lobe oblong, obtuse, saccate at the base; all the lobes whitish, sometimes yellowish green beneath, deep maroon-violet on the inner side; plate of disk narrow, grooved, protruded in front, evanescent below. Column terete, greenish yellow.

Lycaste tetragona, Lindl. in Bot. Reg. 1843, misc. No. 64. Rchb. in Walp. Ann. VI. p. 602. **Maxillaria tetragona,** Lindl. in *Bot. Reg.* t. 1428 (1831). *Bot. Mag.* t. 3146.

An aberrant species both geographically and structurally. Its habitat is in southern Brazil, more than one thousand miles away from its nearest congeners in a geographical sense, *Lycaste plana* and *L. Linguella* of the Andes of Bolivia and southern Peru. Its pseudo-bulbs are distinctly four-angled, and its flowers, unlike those of all other Lycastes, are not solitary, but are borne in threes and fours on one peduncle; these also differ from the Andean species in the sepals and petals being nearly equal, and in their differently-shaped lip. *L. tetragona* was originally introduced in 1827 by Mr. Mutford, of Exeter, who presented a plant to the Royal Gardens at Kew, where it flowered in the summer of 1829; it was shortly afterwards received from Rio de Janeiro by the Horticultural Society of London. It is one of the most distinct of Lycastes, but not generally cultivated; our description was taken from a plant that flowered in our houses in the summer of 1890.

L. xytriophora.

Pseudo-bulbs 3—4 inches long, much compressed, mono-diphyllous. Leaves 12—15 or more inches long. Scapes 4—5 inches long, the bract at the base of the ovary large in proportion to the size of the flower. Flowers 3—4 inches in diameter; sepals oblong, obtuse, with a horny apiculus on the under side, light greenish brown; petals oblong, obtuse, slightly reflexed at the apex, the basal half yellowish green, the apical half white; lip much smaller than the other segments, oblong-ligulate, white sometimes stained with rose-pink on the inner side, three-lobed, the side lobes incurved, the front lobe thickened along the middle, reflexed, undulate at the margin; plate of disk very narrow, grooved, yellow spotted with red. Column triquetral, hairy below the stigma.

Lycaste xytriophora,* Rchb. in Saunders' *Ref. Bot. II.* t. 131 (1882).

The origin of the species is uncertain. In the letterpress accompanying the plate in the *Refugium Botanicum,* Reichenbach expresses his belief that Wallis collected it in the neighbourhood of Loxa, in northern Peru, for M. Linden in 1867. The late Mr. Wilson Saunders states, however, that he obtained his plants from Costa Rica, statements not easy to be reconciled, as these two localities are many hundreds of miles apart. It has recently reappeared in several collections, but the origin of the plants has not been divulged.

HYBRID LYCASTES.

The genus Lycaste offers so indifferent a field, from a horticultural standpoint, for the operations of the hybridist, that very little has been done in the cross-fertilisation of different species. One of the greatest impediments to the crossing of Lycastes, when the object of the hybridist is the obtaining of forms that shall satisfy the requirements of the florist, occurs in the fact that the *facile princeps* of the genus *Lycaste Skinneri*, which would be used in every cross, does not usually flower at a season when any other species is in bloom. The few hybrid Lycastes of supposed natural origin or raised artificially do not appear to have excited much interest. Our knowledge of the forms here described is derived solely from the notices of them in the places quoted.

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* The specific name is obscure; probably *ξύστρον*, "an instrument for scraping, planing, or polishing," in fanciful reference to the shape of the plate on the labellum, was the word selected; if so, the name should be "xystrophora."

Lycaste hybrida.

A hybrid raised artificially from *Lycaste Deppei* and *L. Skinneri* by Mr. W. Marshall, of Auchinraith, Bexley. The flowers are nearly as large as those of *L. Skinneri*; sepals and petals creamy white with a faint tinge of green and thickly dotted with purple on the basal half; lip yellow densely spotted with crimson on the basal half, pure yellow on the recurved front lobe; the tongue-shaped plate of the disk orange-yellow.

Lycaste hybrida, Gard. Chron. X. (1878), p. 535, inedit.

L. Schoenbrunnensis.

A hybrid that flowered in the autumn of 1892 in the collection of the Emperor of Austria, at Schönbrunn, near Vienna. *Lycaste Skinneri* is one parent and *L. Schilleriana* is supposed to be the other. The sepals are 2½ inches long, rose-pink with a distinctly glaucous surface; the petals yellowish white at the base and suffused with light pink above; the lip has a light yellow ground, the crest and side lobes densely spotted and freckled with light purple-crimson. The column is white, except at the base which together with its foot is very deep purple-crimson.

Lycaste Schoenbrunnensis, Orchid Review, vol. I. p. 51.

L. Smeeana.

A supposed natural hybrid between *Lycaste Deppei* and *L. Skinneri* that appeared in the collection of Mr. A. H. Smee at The Grange, Hackbridge. The flowers have nearly the shape of those of *L. Deppei*, but larger; the colour is white except the lip, of which the side lobes have a purple margin and the whole surface is spotted and striped with purple.

Lycaste Smeeana, Rchb. in Gard. Chron. XX. (1883), p. 198.

L. sulphurea.

A supposed natural hybrid between *Lycaste Deppei* and *L. cruenta* that appeared in the nursery of Mr. William Bull at Chelsea. The flowers are smaller than those of *L. cruenta* with the sepals more acute; they are pale sulphur-yellow with some red blotches on the sepals, a large brown-purple blotch at the base of the petals and a few spots above it; the lip has a purple blotch between the side lobes.

Lycaste sulphurea, Rchb. in Gard. Chron. XVIII. (1882), p. 218.

ANGULOA.

Ruiz et Pav. Prod. Fl. Peruv. p. 118, t. 26 (1794). Benth. et Hook. Gen. Plant. III. p. 549 (1883).

In Anguloa we have a small group of species highly prized by horticulturists on account of their large and handsome flowers that appear in the summer months. In its botanical aspect the genus Anguloa is a link in the chain of affinities connecting Lycaste with Stanhopea; to the first named it is indeed very closely allied but clearly separated from it by the very different form of the labellum.

The most obvious floral characters of Anguloa are seen in the fleshy sepals and petals that are connivent, the sepals overlapping the petals, so that instead of spreading they form together a hollow globe, within which the lip and column are almost concealed. The lip is smaller than the other segments and three-lobed, the lateral lobes being much larger than the terminal one which is reduced to a small funnel-like body, two-lipped and hairy at its mouth.*

In their vegetation the Anguloas are robust plants with large dark green pseudo-bulbs that are, at first, enclosed by alternate, imbricating leafy scales that pass upwards into true leaves. The leaves are large, plicate, prominently nerved, and of broadly lanceolate form. The scapes are produced from the base of the pseudo-bulbs, and are clothed with large, lax, pointed sheaths, of which the uppermost, the bract sheathing the ovary, is the largest.

The Anguloas occur on the Andes of South America at 5,000—7,000 feet elevation from northern Colombia southwards to about 10° south latitude in Peru, growing chiefly on damp moss-covered rocks and often in shady woods. Three species only are recognised by botanists, viz., *Anguloa Clowesii, A. Ruckeri* and *A. uniflora,* all the various forms or species so-called by horticulturists being reducible to one or other of these. The typical forms of these three species were all introduced into European gardens about the same time through M. Linden, the cost of whose mission to Venezuela and

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* There is a slight deviation from this structure in *Anguloa uniflora*.

Colombia (1841—43) was partly defrayed by a few English gentlemen deeply interested in orchid culture, including Mr. Barker of Birmingham, Mr. Rucker of Wandsworth, the Rev. John Clowes of Manchester, and others.* The genus was founded by the Spanish botanists Ruiz and Pavón on *Anguloa uniflora,* and was dedicated by them to Don Francisco de Angulo, at that time Director-General of mines in Peru.†

Cultural Note.—The Anguloas are among the most tractable of orchids to cultivate, exacting no extra vigilance or care at the cultivator's hands. The plants should be potted in a compost of two-thirds fibrous peat and one-third of chopped sphagnum moss, to which some cultivators add a little silver sand to assist drainage. This compost should be placed on a drainage of clean broken crocks filling from one-half to two-thirds of the depth of the pot, and from which it should be separated by a layer of moss to prevent the drainage being choked by the filtering through of the compost; the best time for potting is when new roots begin to appear from the base of the pseudo-bulbs. The temperature should be intermediate, that is to say, a range of about 12°—15° C. (55°—60° F.) during the resting season, allowed to sink about 3° C. (5° F.) lower at night, and raised to 15°—18° C. (60°—65° F.) during the growing season with such increments by sun-heat as weather and circumstances permit. After potting, water should at first be moderately applied, gradually increasing the supply as the new growths gain strength, and again in diminished quantity after the pseudo-bulbs and leaves are mature. The young growths should be shaded from direct sunlight, but as maturity is approached they should receive all the light available. The leaves are somewhat liable to be infested with red spider, which may be got rid of by sponging.

Anguloa Clowesii.

Pseudo-bulbs cylindric-oblong, 5—6 inches long, leafless when old. Leaves broadly obovate-lanceolate, acute, 18—24 inches long. Scapes one-flowered, stoutish, erect, as long again as the pseudo-bulbs. Flowers sub-globose, of a uniform citron-yellow, and of a peculiar odour which has not been inaptly compared with that of a chemist's shop; sepals and petals elliptic-oblong, concave, the lateral sepals slightly oblique, shorter and broader, and the petals narrower than the dorsal sepal; lip concave, almost like a boat, articulated with the foot of the column, three-lobed, the side lobes large, triangular, erect; the middle lobe reduced to a small, fleshy, two-lipped hairy funnel of which the upper lip is emarginate and the lower one acute and reflexed. Column very thick, bent, terete above, concave with two rounded processes below the stigma.

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* Lindley in Bot. Reg. 1844, sub. t. 63.

† Owing to the brief diagnosis of the genus given by these authors, and the obscure manner in which it is worded, Anguloa remained for half a century a botanical puzzle till the first flowers expanded in the orchid houses of the gentlemen through whose enterprise all the species were introduced.

Anguloa Clowesii, Lindl. in *Bot. Reg.* 1844, misc. No. 29, and t. 63. Id. 1846, sub. t. 41. *Bot. Mag.* t. 4313. Linden's *Pesc.* t. 17. Warner's *Sel. Orch. I.* t. 33. Rchb. in Walp. Ann. VI. p. 599. *Lindenia, IV.* t. 191.

sub-var.—eburnea.

Flowers ivory-white; in every other respect conforming to the type.

A. Clowesii eburnea, supra. A. eburnea, Williams' *Orch. Alb. III.* t. 133.

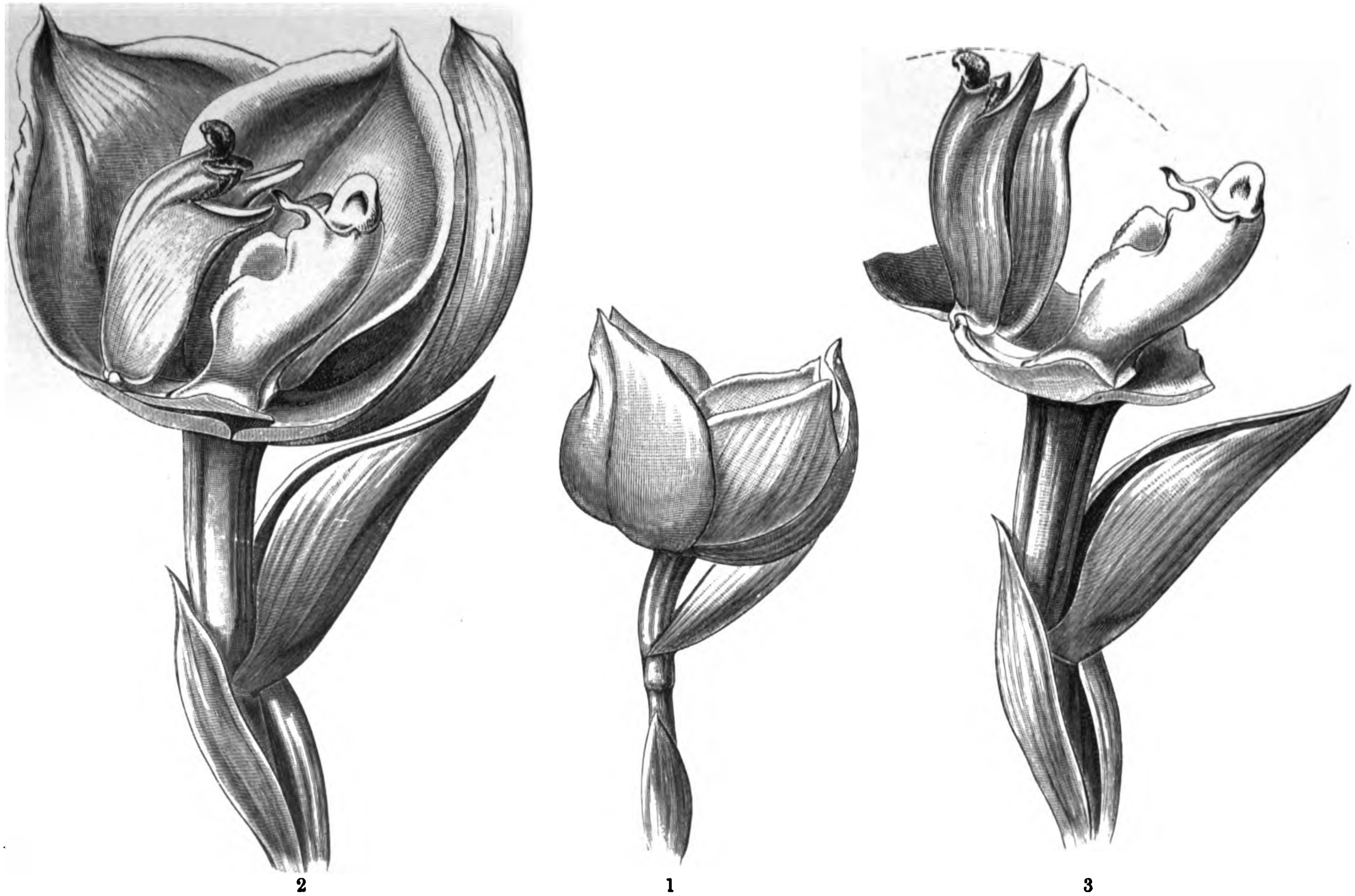
According to his own statement published in *Pescatorea*, M. Linden first detected this orchid near the village of Jaji in the province of Merida in 1842; it was shortly afterwards gathered by Schlim near Ocaña, and a little later still further north by Purdie who sent it to the Royal Gardens at Kew. Its range is now known to extend along both slopes of the eastern Cordillera of New Granada from Santa Martha to Bogota, it being in some localities very abundant. It flowered for the first time in this country in the collection of the Rev. John Clowes, at Broughton Hall, near Manchester, in the summer of 1844. Of the origin and introduction of the variety, a very beautiful and rare one, we find no record; our knowledge of it is derived from a plant in the collection of Sir Trevor Lawrence, Bart., at Burford Lodge.

A. Ruckeri.

Pseudo-bulbs, leaves, and inflorescence as in *Anguloa Clowesii*, but somewhat smaller. Flowers greenish brown externally, yellow densely spotted with red on the inside; sepals and petals elliptic-oblong; the lateral sepals slightly oblique, shorter and broader and the petals narrower than the dorsal sepal; lip three-lobed, the side lobes erect, oblong, rounded at the apex, the intermediate lobe as in *A. Clowesii*. Column short, thick, terete above, swollen below the stigma on each side of the deep furrow that extends thence to the base.

Anguloa Ruckeri, Lindl. in *Bot. Reg.* 1846, t. 41. Rchb. in Walp. Ann. VI. p. 600. *Bot. Mag.* t. 5384 (sanguinea). Warner's *Sel. Orch. II.* t. 10. Regel's *Gartenfl.* 1854, t. 106. *Lindenia, II.* t. 53.

sub-vars—*albiflora*, flowers white, sepals and petals of wax-like texture and aspect; *sanguinea* (Gard. Chron. 1854, p. 271. *Belg. hort. III.* t. 31. *Illus. hort.* s. 3, t. 427. Williams' *Orch. Alb. I.* t. 19), sepals and petals deep sanguineous red on the inside, lip and column yellowish white, the former spotted with crimson.



Anguloa Clowesii.

1, Flower reduced. 2, Flower natural size, with one sepal and one petal removed. 3, Flower with all the sepals removed.

The original form was introduced about the same time as *Anguloa Clowesii,* and through the same agency; it flowered for the first time in the collection of Mr. Rucker, at West Hill, Wandsworth, in the summer of 1846. It continued to be the rarest of the Anguloas in British gardens till the actual habitat of the species was discovered by Blunt while collecting orchids for Messrs. Low and Co. about the year 1870, who found it on the slopes of the eastern Cordillera between Pamplona and Bucaramanga; as it occurs nowhere else so far as at present known, its range is thence the most restricted of all the Anguloas. The sub-variety *albiflora* recently appeared in the collection of Mr. Charles Dorman, at Laurie Park, Sydenham; *sanguinea* was imported many years ago by Messrs. Rollisson, of Tooting.

As distinguished from *Anguloa Clowesii, A. Ruckeri* has smaller pseudo-bulbs and leaves; the scapes are a little shorter and the flowers differently coloured; the lip is shorter, the side lobes of which are rounded and not acute; the column is shorter and more deeply grooved below the stigma.

A. uniflora.

Pseudo-bulbs ovoid-oblong, angulate, 4—6 inches long. Leaves broadly lanceolate, acute, 18—24 inches long. Scapes 6—8 inches long. Flowers more open than in *Anguloa Clowesii* and *A. Ruckeri,* cream-white sometimes tinted and spotted with rose-pink on the inside; sepals ovate, acute, concave; petals smaller, elliptic-oblong, acute; lip three-lobed, the lateral lobes sub-rotund, rolled inwards into a tube; the terminal lobe very small, linear, reflexed, having at its base a bipartite thickened plate. Column clavate with two narrowly oblong auricles at the apex.

Anguloa uniflora, Ruiz et Pav. Fl. Peruv. Syst. p. 228. Id. Prod. Fl. Peruv. p. 118. t. 26 (1794). Lindl. Gen. et Sp. Orch. p. 160. Id. *Bot. Reg.* 1844. t. 60. *Bot. Mag.* t. 4807. Regel's *Gartenfl.* 1883, t. 1137. *Lindenia, VII.* t. 310 (Preyerani).

This is the type species of Ruiz and Pavon, who discovered it at Muña (about lat. 10° S.) during their mission to Peru, 1777—88, and where some years ago it was found by our collector, Walter Davis, associated with *Cypripedium caudatum,* growing among the scrub and low bushes, generally in partial shade. It first became known to horticulture in 1844, when a plant which had been collected by Linden in New Granada two years previously flowered in Mr. Barker's collection at Springfield, Birmingham. Ten years later it was gathered on the slopes of Quindiu, in the central Cordillera of New Granada, thus proving its geographical range to be greater than either of the other species. Variation in the colour of the flowers has been observed, and some of the sub-varieties have received distinguishing names, but none of them appear to be sufficiently distinct to require separate notice here.

HYBRID ANGULOA.

The only hybrid Anguloa known to us, a very beautiful and interesting one, is that described below, which was obtained by Seden in our nursery from *Anguloa Ruckeri* and *A. Clowesii*, the first named being the pollen parent. A hybrid of similar origin was raised some years ago by Mr. J. C. Bowring, of Forest Farm, Windsor, but the plant is said to have died shortly after flowering. From the description of the flower by Reichenbach published in the *Gardeners' Chronicle* of 1881, part II., p. 38, it would seem that the colour of the sepals and petals of Mr. Bowring's plant was somewhat different from that of the same organs in our hybrid. By a curious coincidence, when our hybrid was in flower for the first time in May, 1888, an imported Anguloa flowered in the collection of Mr. R. H. Measures, at The Woodlands, Streatham, which, at first supposed to be a new species, proved to be identical with the artificially-raised hybrid, thus affording further proof of the existence of natural hybrids among orchids.

Anguloa intermedia.

Flowers nearly of the same shape and size as those of *Anguloa Ruckeri*. Sepals and petals yellowish white with a faint flush of rose-purple externally; cream-white on the inside densely spotted with rose-purple, the spots on the petals darker and larger than those on the sepals; lip coloured like the petals, except the disk which is paler and the small two-lipped terminal lobe which is yellow spotted with red.

Anguloa intermedia, Rolfe. in Gard. Chron. III. s. 3 (1888), p. 798.

SUB-TRIBE STANHOPIEÆ.

Stems usually pseudo-bulbous, bearing one or few leaves that are mostly broad and are either plicate or prominently ribbed. Flowers fleshy, of large size and irregular shape, borne in loose racemes, seldom solitary.

CORYANTHES.

Hook. in Bot. Mag. 3102 (1832). Lindl. Fol. Orch. 1852. Benth. et Hook. Gen. Plant. III. p. 549 (1883).

The group of genera forming the sub-tribe STANHOPIEÆ of Bentham is characterised in a remarkable degree by the singular shape of their flowers. So unusual and even grotesque is their aspect and structure that there is nothing to be found, not only in the great Orchidean family itself, but even throughout the Vegetable Kingdom with which they can be aptly compared. In no case is this strangeness more conspicuous than in Coryanthes, the first of the group that claims our attention. Although some of the species of Coryanthes have been known to science for upwards of three-quarters of a century, and most of these have from time to time been in cultivation for nearly so long a period, they are but rarely seen in the orchid collections of the present day.* Curious and interesting in the highest degree as are their flowers, which are among the largest and most extraordinary in form of all orchids, and not devoid of handsome colouration, they are of comparatively short duration; the plants too are somewhat refractory to the cultivator's care, besides taking up space that often can ill be spared.

Upwards of a dozen species of Coryanthes have been introduced into European gardens, and as some of these are quite recent discoveries, the extent of the genus is not accurately known.† They are all natives of tropical America and are dispersed over the vast territory that stretches from Santa Catherina in southern Brazil to Mexico.

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* So scarce have plants of Coryanthes become in the orchid collections of this country that up to the time of these sheets passing through the press we have failed to obtain fresh specimens for examination and description. To avoid the reproach which we should have justly incurred by leaving this remarkable genus unnoticed, we have been obliged to draw upon previously published matter.

† Among the recently introduced species *Coryanthes Bungerothii* (Lindenia, VI. t. 244) and *C. macrocorys* (Id. VIII. t. 342), neither of which we have seen in a fresh state, are evidently not inferior to their predecessors in beauty and interest.

The essential characters of the genus will be well understood from the description of the two species that follow, and from the accompanying woodcut.

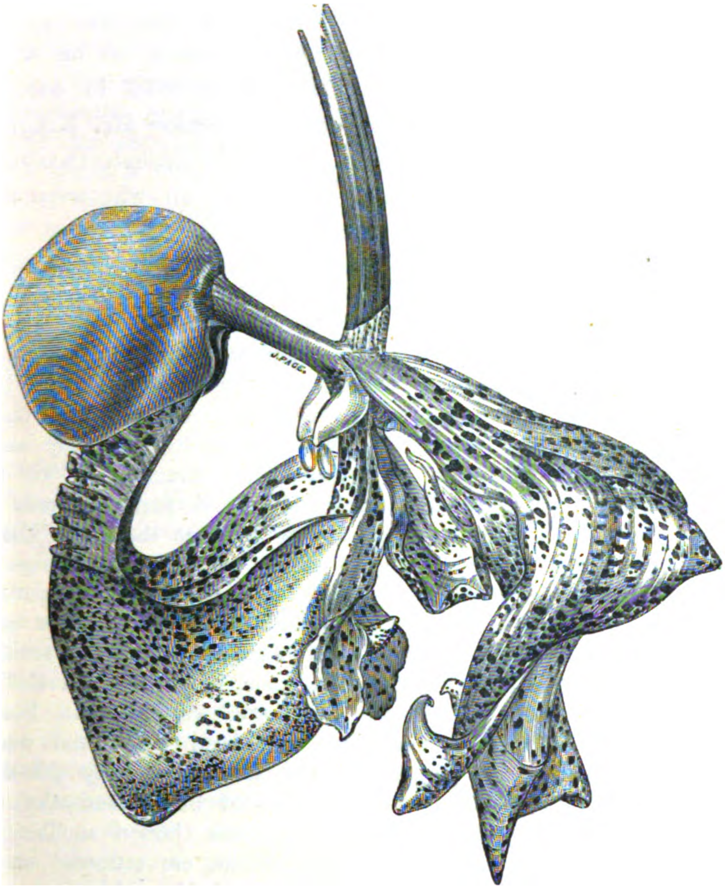
In their vegetation there is little to distinguish the Coryanthes from the Stanhopeas. They have long, strongly ribbed pseudo-bulbs, bearing thin prominently nerved leaves that vary in size in the different species.

The genus was founded by Sir W. J. Hooker on *Coryanthes maculata,* joining with it *C. speciosa* and *C. macrantha,* which he had previously referred to Gongora. The name is formed from *κόρυς,* "a helmet," and *ἄνθος,* "a flower," in reference to the helmet-like appendage (epichile) of the labellum.

Cultural Note.—The cultural treatment of the Coryanthes is essentially the same as that of the Stanhopeas, except that having their home in the hot damp river valleys or near the low-lying sea-shore, they require the highest temperature available in orchid culture. The plants may be established on a block of wood or in a teak basket, either of which can be suspended near the glass where they can receive the greatest amount of light throughout the year. From their known habits and environment in their native country, it follows too that direct sunlight even in summer is beneficial provided an adequate supply of moisture can be maintained; and in the resting season the roots should never be allowed to become dry.

Coryanthes macrantha.

Pseudo-bulbs and leaves as in Stanhopea. "The scapes are produced from the base of the pseudo-bulbs on which two or three flowers are developed. Each flower is placed at the end of a long stiff cylindrical furrowed ovary, and when expanded measures something more than 6 inches from the tip of one sepal to that of the opposite one. The sepals are yellow spotted irregularly with dull purple, and are of a most delicate texture; the upper sepal falls back from the tip of the ovary, is narrow and not above half the length of the lateral two, which, instead of applying themselves to the lip as is usually the case, turn directly away from it, placing themselves at an acute angle with the upper sepal, and after a while collapsing at their sides till they look something like bats' wings half at rest. The petals hang nearly parallel with the column; they are narrowly lanceolate, much curved at the edge, and of the same colour and texture as the sepals. The lip is as fleshy and solid in its texture as the sepals and petals are delicate; it is seated on a deep purple stalk nearly an inch long and forming an obtuse angle with the column; this stalk terminates in a hemispherical, greenish purple cup (hypochile), and contracting at its front edge extends forward into a kind of second stalk (mesochile) of vivid blood colour, the sides of which are thinner than the centre, turned back and marked with four or five deep sharp-edged plaits; these plaited edges again expand and form a second cup (epichile) thinning away very much at the edges, of a broadly conical figure; this second cup is yellow streaked and spotted with light crimson, and seems intended to catch a watery secretion which drips into it from two succulent horns originating in the base of the column and hanging over the centre of the cup."—Lindley in Bot. Reg., sub. t. 1841.



Coryanthes macrantha.

Coryanthes macrantha, Hook. in *Bot. Mag.* t. 3102 (1831). Lindl. Gen. et Sp. Orch. p. 159. Id. Fol. Orch. Coryanthes, No. 3. Id. *Bot. Reg.* t. 1841. Paxt. *Mag. Bot. V.* p. 31. Linden's *Pesc.* t. 30. Gongora macrantha, Hook. Bot. Misc. II. p. 151, t. 80.

From the same source as the foregoing description we derive the following account of the origin of this wonderful plant:—"It was first figured by Sir William Hooker from a specimen in spirits, sent to him from Caracas by Mr. Lockhart. When the plant blossomed in Trinidad, where it is not uncommon in a wild state, the flowers appeared so extraordinary to those who saw them, that the visitors to the Botanic Garden supposed them to be artificial." It flowered for the first time in England in 1836, in our Chelsea nursery, at that time possessed by our predecessor Mr. Knight; and in the following year at Chatsworth, where Sir Joseph Paxton states "the flowers were the wonder and surprise of all who were favoured with an opportunity of seeing them."

We have given the popular description by Dr. Lindley of the flower of this remarkable species in preference to a purely technical one, in the belief that such would be more acceptable to many of our readers, and especially to those who are observant of the extraordinary structure as well as of the surprising beauty of many orchid flowers. Complex as the structure of a Coryanthes flower appears on superficial inspection, a closer examination reveals the fact that in its seemingly anomalous and strange form there is all the essential structure of an ordinary orchid flower; the bi-lateral symmetry is only in part disguised, and the flower is really as normal as regards its parts as that of a Cattleya or an Odontoglossum. But, it will be asked: What is the design of this unusual structure, and what is its use in the economy of the plant? Such an inquiry as this can only be satisfactorily answered after a patient watching of the flower from its first expansion and its surroundings in its native country till it begins to fade, or at least till the purpose has been accomplished for which the flower was created. Fortunately in this case the desired observation has been made, and we thence gladly extract from the Journal of the Linnean Society the following account of the fertilisation of the flowers of *Coryanthes macrantha* by Dr. Crüger, formerly Director of the Botanic Garden at Trinidad.*

"Large humble-bees, noisy and quarrelsome, are attracted at first by the smell of the flower; but the smell probably only gives notice to the insects; the substance they really come for is the interior lining of the labellum which they gnaw off with great industry. They may be seen in great numbers disputing with each other for a place on the edge of the hypochile. Partly by the contest, partly perhaps intoxicated by the matter they are indulging in, they tumble down into the "bucket" (epichile) half-full of the fluid secreted by the horn-like organs at the base of the column. They then crawl along the anterior inner side of the bucket where there is a passage for them. If one is early on the look-out, as these Hymenopters are early risers, one can see on every flower how fecundation is performed. The humble-bee in forcing its way out of its involuntary bath has to exert itself considerably, as the mouth of the epichile and the face of the column fit together exactly, and are very stiff and elastic. The first bee that is immersed will have the gland of the pollen masses glued to its back. The insect then generally gets through the passage and comes out with this peculiar appendage, to return nearly immediately to its feast, when it is generally precipitated a second time into the bucket, passing out through the same aperture, and so inserting the pollen masses into the stigma while it forces its way out, and thereby impregnating either the same or some other flower. I have often seen this, and sometimes there are so many of these humble-bees assembled, that there is a continual procession of them through the passage specified."

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* Vol. VIII. pp. 129, 130 (1865).

Further interesting details of the structure of Coryanthes flowers and the various contrivances by which their fertilisation is effected are given in the *Gardeners' Chronicle*, vol. XXI. (1884), p. 482; XXIII. (1885), p. 144; and XXIV. (1885), p. 103.

C. maculata.

Pseudo-bulbs clustered, 3—5 inches long, ovoid, tapering upwards, diphyllous. Leaves lanceolate, 12—15 inches long. Scapes subpendulous, as long as the leaves, 3—5 flowered; bracts ovate-lanceolate, about one-third as long as the stalked ovaries. Flowers similar in shape and structure to those of *Coryanthes macrantha* but smaller and differently coloured: sepals and petals of membraneous texture, pale ochreous yellow, at first spreading, but soon after expansion becoming flaccid and reflexed; dorsal sepal lanceolate, acute, lateral two 2½ inches long, much broader, broadly ovate, obtuse; petals narrowly oblong, twisted; stalk of labellum ½ inch long, whitish with some purple spots, the helmet-shaped hypochile prolonged into a short channelled mesochile, connecting it with the "bucket" or epichile which is of somewhat conical shape and yellow spotted with purple. Column semi-terete, winged, with two horn-like appendages at the base.

Coryanthes maculata, Hook. in *Bot. Mag.* t. 3102 (1831). Lindl. Gen. et Sp. Orch. p. 159. Id. *Bot. Reg.* t. 1793. Id. Fol. Orch. Coryanthes, No. 2. *Bot. Mag.* t. 3747 (Parkeri). Williams' *Orch. Alb. III.* t. 98. C. Albertinæ, Karsten, Auswahl, t. 1. Van Houtte's *Fl. des Serres, VIII.* t. 755.

A very handsome species, scarcely less curious and interesting than the preceding. It is a native of British Guiana, where it was first detected by Mr. Ankers, by whom it was communicated to Mr. Parker, of Liverpool. It flowered for the first time in this country in the Botanic Garden of that city in June, 1831. It was subsequently found by the German naturalist and traveller, Karsten, near St. Esteban at the foot of the Cumbre de Valencia in Venezuela, and introduced by him into European gardens under the name of *Coryanthes Albertinæ.*

Dr. Lindley remarked of this species that "it is not uncommon in the woods of Demerara, hanging from the branches of trees and suspending in the air the singular lips of its flowers like fairy baskets for the use of the birds and insects that inhabit the surrounding foliage." When the flowers first expand in the glass-houses of this country (and doubtless in their native forests) the horn-like appendages at the base of the column constantly distil water into the bucket-like epichile of the labellum, but the quantity sensibly diminishes with the age of the flower.

The species is variable in the colour of its flowers, a circumstance noticed shortly after its introduction. In the variety figured as *Parkeri* the hypochile of the lip is a dingy brown-purple; in *punctata* and *Albertinæ* the sepals and petals are spotted as well as the labellum, and in the last-named the "bucket" or epichile is sanguineous-red.

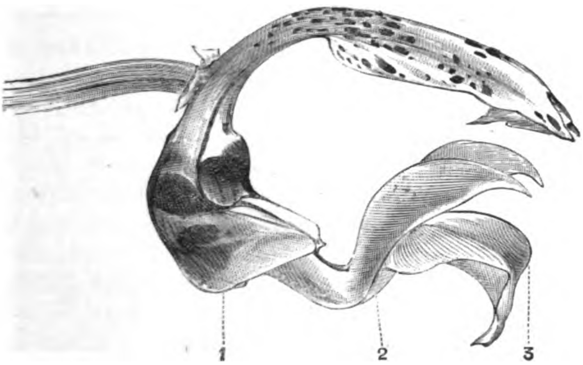
STANHOPEA.

Frost in Bot. Mag. sub. t. 2948 (1829). Lindl. Fol. Orch. 1852. Rchb. Xen. Orch. I. p. 111. Benth. et Hook. Gen. Plant. III. p. 549.

In Stanhopea we have a very natural genus of orchids scarcely less remarkable for the structure and unusual aspect of the flowers than Coryanthes. Like Coryanthes the flowers are large with membraneous sepals and petals of comparatively simple form, while the labellum is fleshy and of complex structure, the most obvious parts of which will be easily recognised from the figure introduced into the text; for so curious are the different parts of the lip of a Stanhopea, that a clear description of them without such help is well-nigh impossible.

Over twenty species of Stanhopea have been published, nearly all of them from garden specimens, for owing to the fleshy texture of the labellum, from which the specific characters are almost wholly derived, their determination in herbaria is extremely difficult. The Stanhopeas are all natives of tropical America, but the information respecting their origin has been so vaguely and even carelessly given by the importers of them, that the precise habitats of not more than half of them are accurately known. By far the greater number of the species have been introduced from Southern Mexico and Central America; two or three are known to inhabit the Andes of Northern Peru, and three or four more occur on the Cordilleras of Colombia and Venezuela. *Stanhopea insignis* and *S. eburnea* are said to be of Brazilian origin, but this requires confirmation.

The following are the most obvious floral characters of Stanhopea:—



Column and lip of Stanhopea Wardii. (1) hypochile, (2) mesochile, (3) epichile.

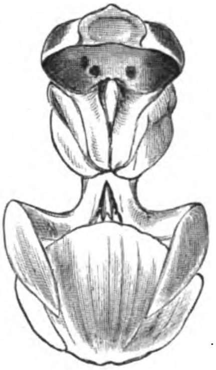
The *sepals* and *petals* are spreading, of membraneous texture and soon fading; the lateral sepals are larger and the petals smaller than the dorsal sepal.

The *labellum* is a remarkable organ of peculiar aspect, in which the tripartite structure common to the ORCHIDEÆ is strongly marked; the three parts are thus usually distinguished:—(1) *hypochile*, the basal portion which is affixed to the base of the column; this is always saccate or hollowed out from above, sometimes globose in outline, sometimes elongated into the form of a boat; (2) *mesochile*, the middle portion consisting of two horn-like bodies either bent round and parallel with the sides of the epichile or bent upwards at a considerable angle to it; (3) *epichile*, the apical portion—this is polymorphous, being cordate, ovate, sub-rhomboidal or even oblong. Both mesochile and epichile are of wax-like appearance, usually white or colourless, but sometimes spotted.

The *column* is greatly elongated, arching over the labellum and almost meeting it at its apex; the wings are membraneous and dilated beyond the middle.*

The most noticeable deviations from this general structure occur in (1) *Stanhopea ecornuta,* discovered by Warscewicz in Central America and now rarely seen in cultivation; it differs from all other Stanhopeas in the lip consisting of the hypochile only and in its much abbreviated and thickened column; (2) *S. eburnea,* in which the horn-like appendages spring from the base and not from the middle of the lip, and in other details as described under that species.

In their vegetation the Stanhopeas not only closely resemble the Coryanthes, but possess a remarkable uniformity *inter se,* so much so that when not in flower many experienced cultivators are unable to distinguish one species from another. The following description is applicable to all the species here noticed.



Front view of lip of Stanhopea Wardii.

The *pseudo-bulbs* are clustered, of ovoid shape, 2—3 inches long, clothed at the base with ragged brown scales, strongly ribbed and monophyllous.

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* It is certain that the remarkable structure we have sketched above is all-important in the economy of the plant and its perpetuation, but why so complex a mechanism has become necessary to its existence and the modifications it has undergone in the lapse of ages before attaining its present form are still among the secrets of Nature. The powerful odour exhaled by the flowers of most of the species, and which are all of short duration, is doubtless an incentive to the larger insects to visit the flowers and to make their way into the hypochile where honey would be likely to be secreted or with the object of gnawing the interior lining which they are said to devour with great avidity, and the forms of the mesochile and epichile are among the contrivances to induce the insect to leave the flower through the opening between the apex of the latter and that of the column, in which case the pollinia would be removed while pressing its way through. For effecting fertilisation, this hypothesis demands the alighting of an insect already loaded with pollinia on another unfertilized flower, and when passing through the apical opening the pollinia would be deposited on the stigma.

The *leaves* are broadly lanceolate or elliptic-lanceolate, prominently nerved beneath, 12—15 or more inches long, narrowed below into a channelled foot-stalk.

The *scapes* are stoutish, pendulous, usually bearing 2—3 flowers, but in a few species 5—7 flowers. The bracts are large, membraneous, more or less inflated, and as long as or shorter than the ovaries.

The genus was proposed by Mr. John Frost, of Kew, for *Stanhopea insignis,* which flowered in the Royal Gardens in October, 1829, and was communicated by him to Dr. (afterwards Sir William) Hooker, by whom it was described in the *Botanical Magazine,* t. 2948. It was named in compliment to Earl Stanhope, at that time President of the Medico-Botanical Society of London.

Cultural Note.—The Stanhopeas require the temperature of the tropical or East Indian house as it is usually called by most cultivators. On account of the flowers being produced on scapes that are quite pendulous, shallow teak baskets are best, so constructed as to admit of the scapes making their way through the bottom and sides, and sufficiently large to afford space for the compost and drainage. The compost should consist of one part fibrous peat and two parts sphagnum moss, some cultivators using sphagnum only, and for drainage long pieces of charcoal laid across the bottom bars of the basket; others prefer clean broken crocks in rather large pieces, and placed so as to allow an easy egress of the flower scapes. During the growing season the supply of water must be constant, but in winter, if the plants are suspended in a house in which a greater or less degree of humidity is always maintained, the Stanhopeas require but little water directly applied. While in flower they may be removed to a cooler and drier house. Red spider and thrip sometimes attack the young leaves, from which they may be removed by sponging with clean tepid water.

Stanhopea Bucephalus.

Pseudo-bulbs and leaves as described above. Scapes 3—5 or more flowered. Flowers powerfully fragrant, tawny orange-yellow with sanguineous spots scattered irregularly over the whole flower, the column whitish and more densely spotted than the other parts; dorsal sepal oblong, acute; lateral sepals much larger, ovate-oblong, acute, 3 inches long; petals similar to the dorsal sepal, but smaller; lip clawed, hypochile cymbiform, narrow at the base, thickened in front; mesochile horse-shoe shaped, the arms bent forwards like the prongs of a hay-fork; epichile broadly ovate or sub-rotund, concave, terminating in a recurved cusp. Column very narrow, winged upwards.

Stanhopea Bucephalus, Lindl. Gen. et Sp. Orch. p. 157 (1832). Id. in *Bot. Reg.* 1843, sub. t. 44, and 1845, t. 24. Id. Fol. Orch. Stanhopea, No. 3. *Bot. Mag.* t. 5278. Rchb. Xen. Orch. I. p. 121. S. grandiflora, Rchb. in Walp. Ann. VI. p. 587 (1863), not of Lindl. Anguloa grandiflora, H. B. K. Nov. Gen. et Sp. I. p. 345 (1815).

This is a handsome species which Dr. Lindley identified as the *Anguloa grandiflora* of Humboldt and Bonpland, and which was discovered by them growing on the trunks of old trees in shady woods near Cuença, in Ecuador, in the beginning of the present century. It was re-discovered on the ascent from Guayaquil to Cuença, at an elevation of 6,000 feet in 1842 by Hartweg, who sent it to the Horticultural Society of London, in whose garden at Chiswick it flowered in the following year.

Stanhopea Bucephalus is occasionally confused with *S. Wardii*, which it much resembles in the colour of its flowers, but from which it is chiefly distinguished by the much narrower hypochile of the lip, in which the maroon spots so conspicuous in *S. Wardii* are absent; also by the more attenuated horns of the mesochile and more slender column; it appears to have now become comparatively rare in cultivation. The specific name is fanciful, literally "ox-head," but probably the name of the celebrated charger of Alexander the Great was intended.*

S. Devoniensis.

Peduncles 2—3 flowered. Flowers fragrant, 4 inches in diameter; sepals broadly ovate, obtuse, light fawn-yellow irregularly spotted with brownish crimson except on the apical area; petals oblong-lanceolate, acute, light fawn-yellow with fewer but larger and darker brown-crimson spots; hypochile of lip saccate, sub-globose, the bottom of the sac almost flat and sub-quadrate, the basal side dark maroon-purple, the remainder white spotted with purple; lobes of the mesochile curved like a bullock's horn, and nearly parallel with the sides of the epichile, ivory-white; epichile cordate with the margins upturned at the almost truncate apex, ivory-white with a few purple spots at the basal end. Column with narrow wings, white spotted with purple except at the apex.

Stanhopea Devoniensis, Lindl. *Sert. Orch.* t. 1 (1839). Id. in Bot. Reg. 1843, sub. t. 44. Id. Fol. Orch. Stanhopea, No. 13. Van Houtte's *Fl. des Serres*, *X.* t. 974. Rchb. Xen. Orch. I. p. 119. Id. in Walp. Ann. VI. p. 586.

The origin of this fine species is virtually unknown; one hypothesis assumes Peru, another Mexico or Guatemala, without any direct evidence being adduced in support of either; we have recently had indirect evidence of its being of Mexican origin, which is supported by its nearest affinities being undoubtedly Mexican. It somewhat resembles *Stanhopea tigrina* in colour, but is distinguished from that species by the differently-shaped epichile of the labellum and by the very narrowly-winged column. It flowered for the first time in this country at Chatsworth in 1837, and is named in compliment to the then Duke of Devonshire.

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* This celebrated horse died in North-west India after the battle with King Porus, and after carrying Alexander through all his campaigns. It had been purchased by his father Philip for thirteen talents, and no one was able to break it in except the youthful Alexander.

S. eburnea.

Scapes usually two-flowered. Flowers ivory-white with some purple spots on the lip; sepals oblong-lanceolate, acute, 2½ inches long; petals similar but narrower; lip narrowly oblong in outline, the hypochile boat-shaped, with two horn-like auricles at the base; the epichile ovate-oblong, sub-acute. Column arching, as long as the lip, with two rounded membraneous wings above the middle.

Stanhopea eburnea, Lindl. in *Bot. Reg.* t. 1529 (1832), and 1843, sub. t. 44. Id. Gen. et Sp. Orch. p. 158. Id. Fol. Orch. Stanhopea, No. 19. *Bot. Mag.* t. 3359. Rchb. Xen. Orch. I. p. 117. Id. in Walp. Ann. VI. p. 582. Ceratochilus grandiflorus, Lodd. *Bot. Cab.* t. 1414.

An anomalous species first cultivated by Messrs. Loddiges in 1824, to whom it had been sent from Trinidad by Sir Ralph Woodford; it was thence the first Stanhopea that was introduced into British gardens. A quarter of a century later it was gathered in Surinam by Wullschlägel, and in Venezuela by Wagener who sent living plants to Europe; its habitat is therefore along the northern littoral of South America. It flowered in Mr. Bateman's collection at Knypersley, near Congleton, in 1832, on which occasion it was figured in the *Botanical Register*; and in the following year it was communicated to Sir William Hooker by Messrs. Shepherd, of Liverpool.* From that time to the present it has occasionally appeared in cultivation; our description was taken from a plant that flowered in our houses in 1889, whose origin we are unable to trace. *Stanhopea eburnea* is well distinguished by the horn-like appendages springing from the base of the lip and not from the middle, and by its long boat-shaped hypochile as seen in profile.

S. ecornuta.

Scapes short and stoutish, usually two-flowered. Flowers about 3 inches across vertically; sepals and petals cream-white, the latter spotted with purple at the base, all pointing in one direction; the sepals oblong, obtuse, concave; the petals sub-quadrate, much smaller; lip calceolate, ventricose at the base and beneath, thickened in front into three rounded protuberances, yellow deepening to dark orange at the base and on the inside.* Column semi-terete with two fleshy rounded wings, yellow.

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* In both cases erroneously stated to be of Brazilian origin.

Stanhopea ecornuta, Lemaire in Van Houtte's *Fl. des Serres, II.* pl. 181 (1846). Lindl. in Paxt. Fl. Gard. I. No. 54, icon. xyl. Id. Fol. Orch. Stanhopea, No. 20. Rchb. in Bot. Zeit. X. p. 836 (1852). Id. *Xen. Orch. I.* p. 124, t. 43. Id. in Walp. Ann. VI. p. 583. Stanhopeastrum ecornutum, Rchb. in Bot. Zeit. X. p. 927 (1852).

An aberrant species differing from every other Stanhopea in its much simplified labellum, which consists of the hypochile only; in its shorter column with thickened wings; and in the fleshy texture of the sepals, which when first expanded assume a different position. It was at first regarded by Lindley as a monstrous state of some other species, a view that was dispelled by the constancy of the plants that subsequently flowered. A new genus was proposed for it by Reichenbach under the name of Stanhopeastrum, but this he soon after abandoned and restored it to Stanhopea, of which it is the most archaic form that has yet been discovered.

Stanhopea ecornuta, so called from the absence of the horns of the labellum, was discovered by Warscewicz in the forests around San Toma in Guatemala, in 1845; it was introduced into European gardens in the following year through him by Van Houtte of Ghent.

S. graveolens.

Scapes usually two-flowered. Flowers powerfully odorous; sepals and petals at first greenish white passing into straw-yellow; the sepals ovate-oblong, acute, concave and spreading; the petals much narrower, ovate-lanceolate, reflexed, undulate at the margin; hypochile of lip saccate approaching cymbiform, deep apricot-yellow; horns of mesochile curved outwards and inwards, much attenuated at the apex, ivory-white; epichile ovate, acute, concave, ivory-white sometimes dotted with purple. Column broad, winged to near the base, the wings terminating in points that extend a little beyond the apex of the anther.

Stanhopea graveolens, Lindl. in Bot. Reg. 1840, misc. No. 125; and 1845, sub. t. 65. Id. Fol. Orch. Stanhopea, No. 8. Van Houtte's *Fl. des Serres,* Aug. 1846, pl. I. and II. Rchb. Xen. Orch. I. p. 122.

This was cultivated by Dean Herbert in 1840, who had acquired by purchase a plant whose origin was unknown. A few years later the species appeared in several collections, both British and Continental, the plants being supposed to have been imported from

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* Four small gibbosities, two at the base and two at the apex, indicate the rudiments of the aborted horns.

Guatemala. The odour of the flowers is disagreeably powerful, communicating itself to the fingers when touched.

Very near *Stanhopea graveolens* is the scentless *S. inodora*, a native of Mexico, which we have not seen in cultivation.

S. insignis.

Scapes usually two-flowered. Flowers fragrant; sepals and petals more or less reflexed, dull pale yellow dotted with purple except on the apical area; the dorsal sepal ovate-lanceolate, the lateral two much broader, ovate-oblong; the petals broadly linear, acute; hypochile of lip sub-globose or sub-hemispheric (longer than broad), much thickened and contracted in front, deep purple beneath, whitish and much spotted with purple above; mesochile horse-shoe shaped, the arms bent inwards, attenuated, and almost meeting at their extremities, ivory-white sometimes sparingly spotted with purple; epichile cordate, sub-acute, deeply channelled along the middle, white more or less spotted with purple. Column as long as the lip, slightly arched, with two broad, rounded, membraneous wings above the middle, white stained and spotted with purple.

Stanhopea insignis, Frost and Hook. in *Bot. Mag.* t. 2948 (1829). Lodd. *Bot. Cab.* t. 1985. Lindl. Gen. et Sp. Orch. p. 157. Id. in *Bot. Reg.* t. 1837; and 1843, sub. t. 44. Id. Fol. Orch. Stanhopea, No. 1. Rchb. Xen. Orch. I. p. 118. Id. in Walp. Ann. VI. p. 585.

The species on which the genus was founded and one of the first Stanhopeas cultivated in British gardens, it having been introduced to the Royal Gardens at Kew some time prior to 1829, in which year it flowered for the first time; in the following year it flowered in the collection of Mr. Cattley at Barnet, and a little later in the garden of Earl Fitzwilliam, at Wentworth, near Sheffield, it being at that time a very rare plant. It was originally found by Humboldt and Bonpland on the trunks of old trees in shady woods near Cuença in Ecuador, in the beginning of the present century.* *Stanhopea insignis* is well distinguished by its purple globose hypochile and heart-shaped epichile.

S. Martiana.

Flowers as large as *Stanhopea insignis*; sepals broadly ovate, obtuse, pale straw-yellow or white sparingly spotted with crimson-purple; petals oblong, sub-acute, with larger spots than the sepals; hypochile of lip hemispheric, dark purple on the inside; horns of mesochile long, broad at the base, tapering into slender cirri at the apex; epichile narrowly oblong, tridentate at the apex, both mesochile and epichile ivory-white. Column wingless, white spotted with purple.

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* Lindl. in Bot. Reg. sub. t. 1837. The assertion that Loddiges imported it from Brazil is erroneous.

Stanhopea Martiana, Batem. in Bot. Reg. 1840, misc. No. 109. Id. *Orch. Mex. et Guat.* t. 27. Lindl. in *Bot. Reg.* 1844. t. 44. Id. Fol. Orch. Stanhopea, No. 12. Rchb. Xen. Orch. I. p. 119. Id. in Walp. Ann. VI. p. 586. Van Houtte's *Fl. des Serres, XX.* t. 2112.

Discovered by Karwinsky in Mexico, in 1837, and communicated by him to Mr. Bateman, in whose collection at Knypersley it flowered in May, 1840; it was shortly afterwards sent to Mr. Richard Harrison, of Liverpool, by Galeotti. As the botanical collections of these two explorers were made chiefly in the neighbourhood of Oaxaca, the richest orchid district in Mexico, the habitat of the plant may be assumed to be in that district. The species is dedicated to the late Professor Martius, of Munich, one of the earliest botanical explorers of the Amazon region of Brazil; it is well distinguished by the cirri-like apices of the mesochile, the long narrow epichile and the downy and almost wingless column.

S. oculata.

Scape 5—7 flowered. Flowers 5 inches across vertically, very odoriferous, and very variable in colour; sepals broadly ovate, acute, concave, the lateral two broader than the dorsal one, sometimes pale yellow with numerous ocellated red spots, sometimes with few spots and more rarely wholly white; petals ligulate, much smaller, thinner in texture, and with the spots more scattered than on the sepals or entirely absent; lip narrowly oblong in outline; the hypochile boat-shaped, the basal half light orange-yellow with two blackish lateral spots, the anterior half white spotted with red but sometimes destitute of spots; horns of mesochile first erect and then slightly bent inwards and forwards, much acuminated; epichile cordate, acute, concave, both mesochile and epichile ivory-white, the latter sometimes spotted with purple. Column sub-terete, bent, with two rounded wings above the middle, greenish or white spotted with red but sometimes without spots.

Stanhopea oculata, Lindl. Gen. et Sp. Orch. p. 158 (1832). Id. in *Bot. Reg.* t. 1800; and 1843, sub. t. 44. Id. Fol. Orch. Stanhopea, No. 4. Rchb. Xen. Orch. I. p. 120. Regel's *Gartenfl. IV.* t. 89 (crocea). *Bot. Mag.* t. 5300. *Lindenia, VI.* t. 256. Ceratochilus oculatus, Lodd. *Bot. Cab.* t. 1764.

A very handsome species, first imported in 1829 by Messrs. Loddiges from Xalapa in Mexico through Deppe. It flowered in their nursery in June, 1831, and three years later in Mr. Bateman's collection at Knypersley. It was shortly afterwards sent from Guatemala by Mr. G. Ure Skinner to Mr. Harris, of Kingsbury, and to other correspondents. It is one of the best known of Stanhopeas and also one of the most variable in the colour and spotting of its flowers. As a species it is distinguished by its long narrow lip, of which the horns of the mesochile are short, broad, and at a considerable angle to the epichile.

Mr. Skinner in a communication to Mr. Harris respecting the habitat of *Stanhopea oculata* in Guatemala stated that he found it growing on the same tree as *Oncidium leucochilum* in the higher temperatures, and recommended for its culture in Europe that it should be kept in a temperature not colder than 13° C. (55° F.) nor warmer than 21° C. (70° F.), that it should be well watered from June to September, and from October till May only slightly watered every evening at sunset to resemble the dews of its native home—not, it must be recollected, so heavy as people represent them in Europe, the region being high and very different from a coast climate. The seasons are the same as in England, the coldest weather being from December to February when the thermometer sometimes sinks to 3°—5° C. (36°—42° F.) at sunrise.*

S. Platyceras.

Scapes stoutish, usually two-flowered. Flowers nearly as large as those of *Stanhopea tigrina*; sepals and petals nankeen-yellow spotted with red-purple, many of the spots ocellated, the sepals broadly ovate-lanceolate, sub-acute; the petals linear-lanceolate, acute; hypochile of lip broadly cymbiform, produced near its front end into a fleshy oblong process, maroon-purple, paler and spotted at the basal end; horns of mesochile broadly sickle-shaped; epichile shortly clawed, ovate, acute; both mesochile and epichile whitish more or less spotted with red-purple. Column long and slender, slightly arching, narrowly winged beyond the middle, whitish dotted with purple.

Stanhopea Platyceras, Rchb. in Gard. Chron. 1868, p. 27. Saunder's *Ref. Bot. II.* t. 108 (1878). *The Garden, XXXIII.* (1888), t. 652.

A very handsome species introduced by Messrs. Low and Co. from New Granada, and which flowered for the first time in this country in the collection of Mr. John Day at Tottenham, in 1867, and subsequently in that of Mr. Wilson Saunders at Highfield, Reigate, and in other places; its precise habitat has not been divulged. The specific name, from πλατὺς, "broad," and κέρας, "a horn," refers to the unusually broad horns of the mesochile, and which with the curved and broad boat-like hypochile well distinguishes the species. Mr. James O'Brien, of Harrow, kindly sent us materials for description.

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* Bot. Reg. 1840, misc. p. 44.

S. tigrina.

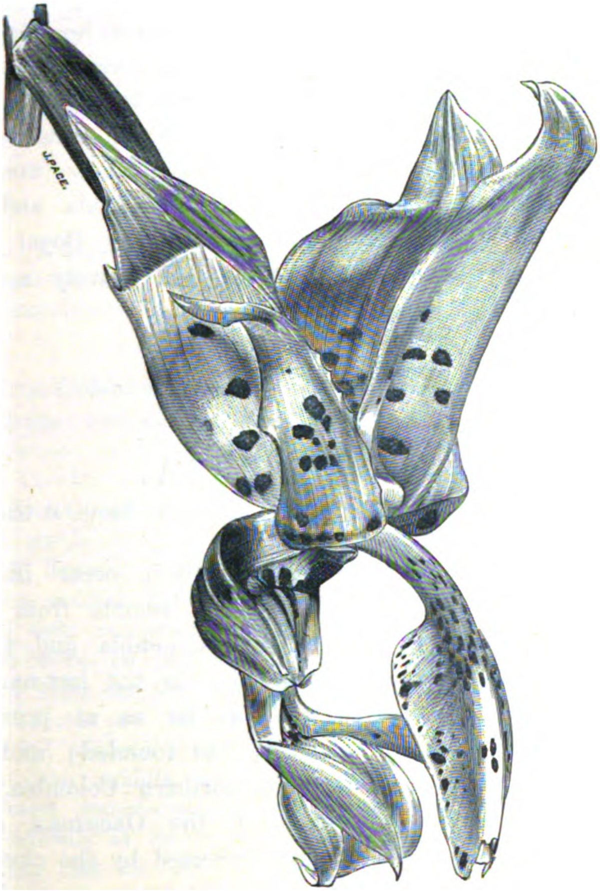
Scapes 3—4 flowered; flowers 6—7 inches across the lateral sepals. Sepals broadly ovate, obtuse, deep sanguineous red with a few pale yellow spots and blotches near the base, and a larger pale yellow area at the apex; the dorsal sepal narrower and more obtuse than the lateral two which are concave; petals linear-oblong, with revolute margins, dark vinous red at the base, the middle area blotched with vinous red and pale yellow, the apical area wholly yellow or sparingly spotted; lip broadly oval in outline; the hypochile deeply concave, in shape like the stern half of a boat, orange-yellow blotched with maroon-purple at the sides; the mesochile two sickle-like horns, bent round towards the apex of the epichile and nearly parallel with its sides, ivory-white spotted with purple to beyond the middle; the epichile sub-rhomboidal, three-toothed at the apex, ivory-white spotted with purple. Column gently curved, compressed, with two rounded wings, yellowish spotted with red.

Stanhopea tigrina, Batem. *Orch. Mex. et Guat.* t. 7. Lindl. in *Bot. Reg.* 1839, t. 1; and 1843, sub. t. 44. Id. Fol. Orch. Stanhopea, No. 11. *Bot. Mag.* t. 4197. Van Houtte's *Fl. des Serres, VII.* t. 713. Rchb. Xen. Orch. I. p. 120. *Lindenia, II.* t. 51. Gard. Chron. IV. s. 3 (1888), p. 418, icon. xyl.

This very remarkable Stanhopea, the largest and in some respects the handsomest of the genus, seems to have been known to the Jesuit, Hermandez, who wrote on the Natural History of Mexico in the seventeenth century and who mentions it under the name of *Coatzonte Coxoahitl,* doubtless the vernacular name of the plant at that epoch; but his description is too vague to render the identification with *Stanhopea tigrina* certain, although highly probable. The plant appears to have been overlooked by the Mexican botanists La Llave and Lexarza, the latter of whom published his *Orchidaceum Opusculum* in 1825, in which he describes fifty species of Mexican orchids; but owing to the terse and quaint mode of description employed, it must be admitted that several of them cannot now with certainty be identified.

Stanhopea tigrina was first figured and described by Mr. Bateman in his *Orchidacea of Mexico and Guatemala* shortly after its introduction into British gardens by Messrs. Low and Co., of Clapton, through their collector Henchman, who gathered it in 1835 at a considerable elevation on the mountains in the neighbourhood of Xalapa; it flowered for the first time in this country in Mr. Bateman's collection at Knypersley in May, 1837. It was shortly afterwards detected by Hartweg and also by Galeotti growing upon oaks in thick forests covering the Cordillera near Vera Cruz at 3,000—4,000 feet elevation.

It has since been gathered in Guatemala, and one of our collectors affirms with confidence that he gathered this same species on the eastern Cordillera of New Granada at some distance north of Bogota; its geographical range is therefore considerable. The flowers are somewhat variable in colour, and some of the sub-varieties have received distinctive names, as *lutescens*, *nigro-violacea*, etc.



Stanhopea Wardii.

S. Wardii.

Scapes robust, 12—15 inches long, pale glaucous green spotted with dull crimson, 5—7 flowered. Flowers large and fragrant; sepals and petals golden yellow sometimes spotted with red-purple, the sepals elliptic-oblong, acute, concave; the petals much narrower, ligulate, acute;

hypochile of lip cymbiform, gibbous in front beneath the mesochile, saccate at the base where it is orange with two maroon spots, or wholly maroon, the front part orange-yellow but sometimes whitish; horns of mesochile narrowly falcate and bent over the epichile, light yellow or ivory-white; epichile cordate, acute, incurved at the margins, pale yellow spotted with red. Column nearly straight with two rounded wings, and coloured like the epichile of the lip.

Stanhopea Wardii, Lindl. Sert. Orch. t. 20 (1839). Id. in Bot. Reg. 1843, sub. t. 44. Id. Fol. Orch. Stanhopea, No. 6. Rchb. Xen. Orch. I. p. 122. Id. in Walp. Ann. VI. p. 588. Knowles and Westc. *Fl. Cab. II.* pl. 90. *Bot. Mag.* t. 5287. *Lindenia, VII.* t. 315. S. aurea, Lodd. in Bot. Reg. 1841, misc. No. 31.

One of the best known of the Stanhopeas; it was originally introduced from La Guayra, the port of Caracas, by Messrs. Loddiges in 1828 through their correspondent Mr. Ward, after whom it was named; and shortly afterwards by Messrs. Low from the same locality. It was subsequently found in Guatemala and sent from that country to Messrs. Loddiges and to the Royal Gardens at Kew. It is easily recognised by the dark velvety maroon colour of the cavity of the hypochile.

HOULLETIA.

A. Brongn. in Ann. Sc. Nat. s. 2, vol. XV. p. 37 (1841). Benth. et Hook. Gen. Plant. III. p. 550.

Houlletia includes about six species which occur in two parts of the South American continent widely remote from each other, viz., the Andean region of northern Colombia and the province of Rio de Janeiro in southern Brazil; in the last-named region, however, the genus is represented, so far as at present known, by a single species, that on which it was founded; and the others are found within a limited area in northern Colombia. Houlletia therefore affords another instance of the ORCHIDEÆ of northern Colombia and southern Brazil being connected by the closest affinities and at the same time separated by an immense geographical space.*

Botanically Houlletia has Stanhopea for one of its nearest affinities, but from which it is clearly distinct in its floral characters; the bilateral symmetry of the flowers is also much less disguised than in Stanhopea. The most obvious floral characters are:—

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* Thus, Cattleya, Cypripedium, Miltonia, Rodriguezia, Ionopsis, and several others. But it must be remembered that the intervening region has thus far been very imperfectly explored; in fact, the greater part of it except along the banks of the navigable rivers is practically unknown botanically.

The *sepals* and *petals* are similar, sub-equal, and more or less spreading. (Not unequal and reflexed as in Stanhopea.)

The *lip* is distinctly articulated at the middle; it has horn-like processes as in Stanhopea, but they are produced from the basal half (hypochile) and turned backwards.

In their vegetation the Houlletias agree with the Stanhopeas in having prominently ribbed, monophyllous, small pseudo-bulbs, but the footstalks of the leaves are much longer in proportion to the blade. The scapes are erect and are 5—10 or more flowered.

The genus commemorates the name of M. Houllet, the discoverer of the type species in Brazil, who after his return to France was appointed Curator or *Chef des cultures* of the Jardin des Plantes at Paris.

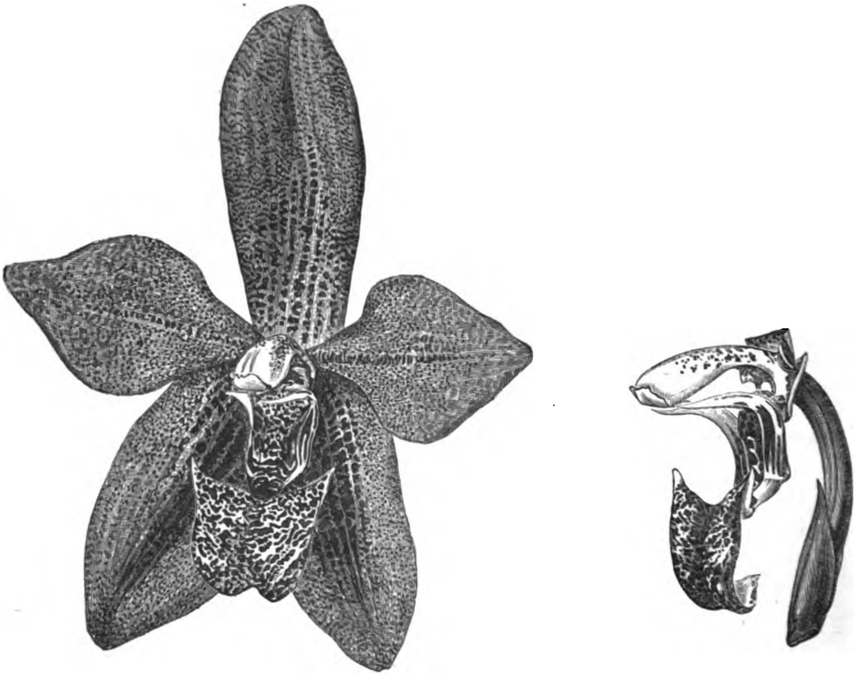
Cultural Note.—The cultural treatment of the Houlletias is the same as that of the Stanhopeas, except that they may be grown in a lower temperature such as is maintained in an intermediate house.

Houlletia Brocklehurstiana.

Pseudo-bulbs ovate-oblong, 3—4 inches long, strongly ribbed and furrowed when old, monophyllous. Leaves with a long sub-terete foot-stalk, 12—15 inches long; the blade lanceolate-oblong, acuminate, plaited, 18—24 inches long. Scapes stoutish, erect, 18—24 inches high, dull purple mottled with pale green, racemose along the distal half, 7—10 flowered; bracts narrowly lanceolate, acuminate, half as long as the stalked ovaries. Flowers 3 inches in diameter; sepals and petals light red-brown striated with pale yellow and spotted with darker red-brown on the basal half, the lateral sepals with a dark sanguineous stain on the inner side; dorsal sepal and petals ovate-oblong, sub-acute and concave; lateral sepals broader, elliptic-oblong, keeled behind towards their tip; lip shorter than the other segments, jointed at the middle, the hypochile white densely spotted with blackish warts, transversely oblong at the base, then narrowly oblong, produced laterally at its junction with the epichile into two ascending curved horns that are whitish streaked with red-purple; the epichile broadly trowel-shaped, reflexed at the apex and prolonged at the lateral angles into short cusps; it is covered with blackish purple warty asperities and light orange reticulations. Column clavate, triquetral, concave below the stigma, light tawny yellow spotted with red.

Houlletia Brocklehurstiana, Lindl. *Sert. Orch.* t. 41 (1839). Id. in Bot. Reg. 1841, misc. No. 99. *Bot. Mag.* t. 4072. Paxt. *Mag. Bot. IX.* p. 49. Regel's *Gartenfl.* 1858, t. 229. Linden's *Pesc.* t. 36. Rchb. in Walp. Ann. VI. p. 615. *Lindenia, V.* t. 214. Williams' *Orch. Alb. VIII.* t. 337.

This is the handsomest and best known of the Houlletias. It was introduced from Rio de Janeiro by Mr. Wanklyn, of Manchester, by whom it was communicated to Mr. Brocklehurst, of The Firs, near Macclesfield, at that time the possessor of one of the best orchid collections in England, and in which this orchid flowered for the first time in 1841. On the flowers being sent to Dr. Lindley for identification he doubtfully referred the species to Maxillaria, but immediately afterwards removed it to Houlletia on the publication of that genus by the eminent French botanist, Adolphe Brongniart, in the *Annales des Sciences Naturelles.* A short time previous to its introduction into this country, this orchid had been discovered growing on trees at Corcovado, near Rio de Janeiro, by Houllet, a French gardener, who had accompanied M. Guillemin on a mission to Brazil, and who brought living specimens to the Jardin des Plantes at Paris, where on its flowering it was constituted a new genus by M. Brongniart, but who singularly enough omitted to give it a specific


Houlletia Brocklehurstiana.

name. As *Houlletia Brocklehurstiana* is the only Houlletia that has been found in the neighbourhood of Rio de Janeiro, there can be but little doubt that it is Brongniart's type species.

It was next detected on the Organ Mountains by Gardner, whose herbarium specimen is still preserved at Kew; after him by William Lobb, who sent plants to our Exeter firm in 1842. From that time to the present it has probably never been absent from British collections, where its stately habit and sombre aspect afford a very distinct feature when the plant is in flower. The numerous illustrations quoted above attest the high favour in which this orchid has been held by horticulturists; they also show considerable variability in the colour of the flowers.

H. chrysantha.

Pseudo-bulbs, leaves and inflorescence as in *Houlletia Brocklehurstiana* except that the leaves are smaller and the scapes shorter and fewer-flowered. Flowers 2½ inches in diameter, light yellow spotted with sanguineous red; sepals and petals similar and sub-equal, broadly oval, obtuse, more or less incurved; hypochile of lip with two dolabriform, obliquely incurved auricles each with an acute tooth at the front angle; epichile broadly cuneate at base, sub-rhomboidal, rounded at the apex and with a horn-like appendage at each of the lateral angles.

Houlletia chrysantha, André in *Illus. hort. XVIII.* p. 138, t. 71 (1871).

A distinct species, especially as regards the structure of the labellum, discovered by Gustav Wallis in the Colombian province of Antioquia, and introduced by him to M. Linden's horticultural establishment at Brussels, where it flowered for the first time in Europe in 1871. Our materials for description were derived from the collection of the late Mr. Neville Wyatt, at Lake House, Cheltenham.

H. odoratissima.

Pseudo-bulbs, leaves and inflorescence nearly as in *Houlletia Brocklehurstiana.* Flowers fragrant, nearly 3 inches in diameter, bright chocolate-red except parts of the lip which are white; sepals oval-oblong, obtuse, concave, the lateral two broader than the dorsal one; petals much smaller, linear-spathulate, acute; hypochile of lip sub-quadrate with two slender horn-like appendages that are bent backwards;

epichile hastate, produced at the lateral angles into two short horns. Column triquetral, bent, slender at the base, dilated upwards.

Houlletia odoratissima, Lindl. in Paxt. Fl. Gard. III. p. 172 (1853). Linden's *Pesc.* t. 3. Rchb. in Walp. Ann. VI. p. 616. Gard. Chron. XXII. (1884), p. 38 (xanthina); and XXIV. (1885), p. 777. icon. xyl. Godefroy's *Orchidophile*, 1887, p. 273. *Lindenia, VII.* t. 324.

var.—antioquiensis.

Scapes longer and more robust. Flowers larger with broader segments; sepals and petals rich chocolate-brown shaded with maroon towards the base; epichile of lip and apex of column light yellow.

H. odoratissima antioquiensis, André in *Illus. hort. XVII.* p. 59. t. 12 (1870). Williams' *Orch. Alb. VII.* t. 316. *Rev. de l'Hort. Belge,* 1890, p. 121.

Originally discovered by Schlim in 1849, in the province of Soto, on the east side of the river Magdalena, on the banks of streams where its powerful odour betrayed its presence, and two years later it was collected by him in the *Weinmannia* forests near Ocaña, and introduced to M. Linden's horticultural establishment at Brussels. It flowered for the first time in Europe in M. Pescatore's collection at St. Cloud, near Paris, in 1852.

The variety, a very distinct one, is a geographical form from the opposite or western side of the Magdalena; it was discovered by Gustav Wallis in 1868, in the province of Antioquia, and introduced by him to M. Linden's establishment.

H. picta.*

Pseudo-bulbs, leaves and inflorescence as in the type species. "Flowers 3½ inches in diameter; perianth spreading, the basal half tessellated with yellow and cinnamon-brown, the apical half wholly cinnamon-brown; sepals narrowly oblong, obtuse; petals rather smaller, narrowed towards the base; hypochile of lip somewhat trapeziform, the sides produced backwards into long ascending spines, the disk yellow blotched with red-purple; epichile broadly hastate, the posterior angles produced into short recurved horns, reflexed and deeply channelled at the apex, light yellow with some short transverse red bars. Column yellow blotched with brown on the back."—*Botanical Magazine.*

Houlletia picta, Rchb. in Regel's Gartenfl. 1856, p. 2. Id. in Walp. Ann. VI. p. 616. *Bot. Mag.* t. 6305.

"Discovered by Schlim in New Granada, along with other very similar species of the genus, collected up to an elevation of 4,000—6,000 feet. It first flowered in the celebrated orchid garden of Consul Schiller at Hamburgh, and later at Farnham Castle, from whence the specimen figured in the *Botanical Magazine* was obtained. It differs very slightly from the type species."†

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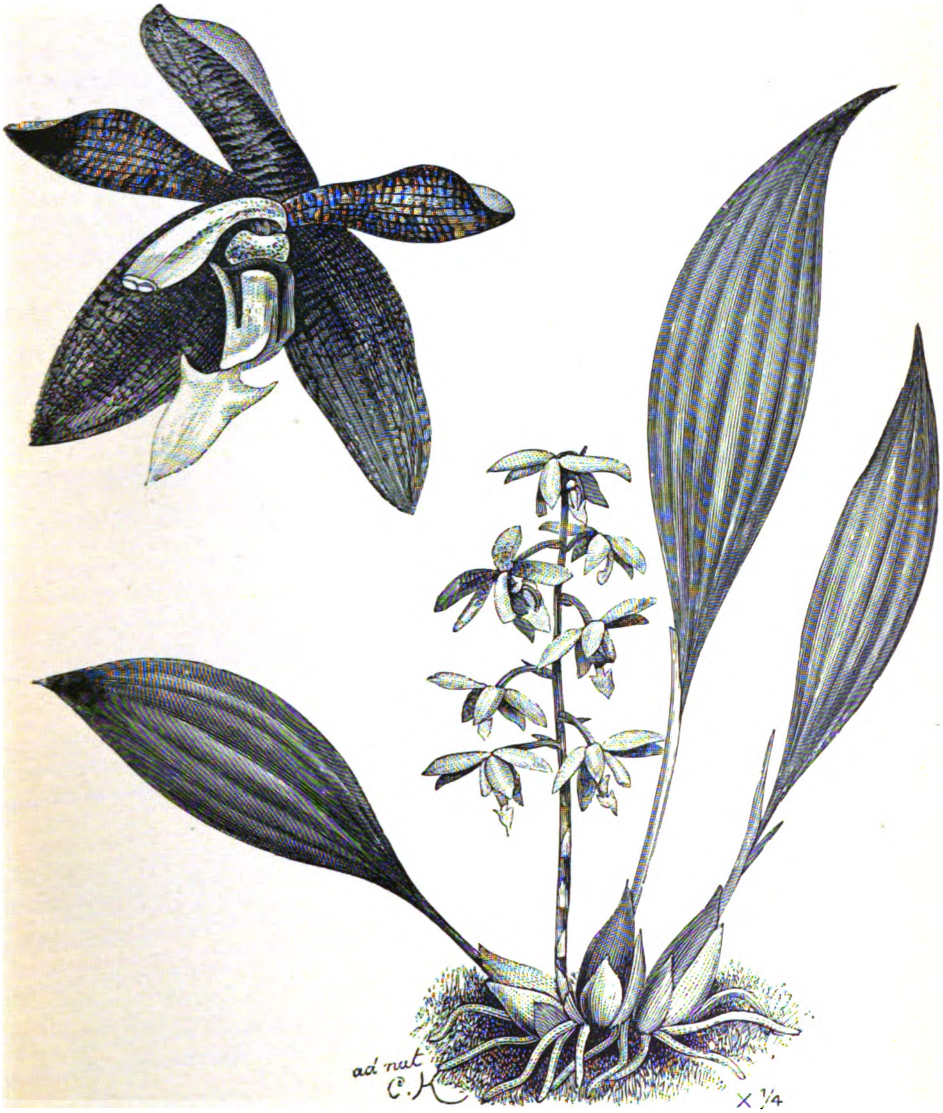
* Not seen by us.

† Bot. Mag. sub. t. 6305.



Houlletia odoratissima.
(From the *Gardeners' Chronicle.*)

MOOREA.

Rolfe in Gard. Chron. VIII. s. 3 (1890), p. 7.

This is a new genus founded by Mr. Rolfe, of the Kew Herbarium, on a species acquired by Mr. F. W. Moore at a sale of orchids, and which upon flowering in the Glasnevin Botanic Garden was found to conform to no known genus. It is of too much interest to be passed over unnoticed, and we have therefore transcribed the published description of the author. Following Mr. Rolfe we have placed Moorea next to Houlletia, from which it differs "in the lip being without a claw and articulated with the base or foot of the column, and by its epichile not being articulate with the hypochile."

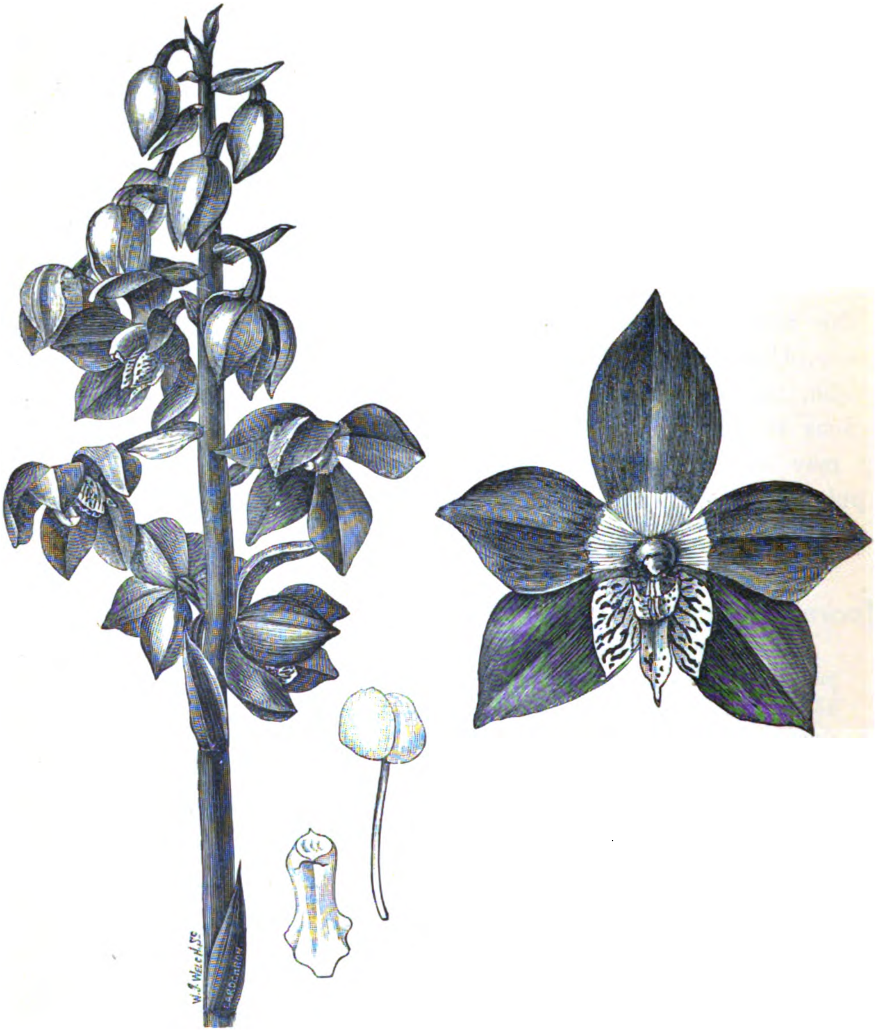
The new genus worthily commemorates the name of Mr. F. W. Moore, Curator of the Royal Botanic Garden at Glasnevin, near Dublin, in recognition of "his large series of very valuable contributions to the Kew Herbarium, extending over a long period," and we may on our part add—his constant and untiring kindness in supplying us with specimens of rare and little known orchids for description in this work.

Moorea irrorata.

"Pseudo-bulbs ovoid-oblong, 2½ inches long, diphyllous. Leaves petiolate, plicate, lanceolate, shortly acuminate, 1½ to 2 feet long, 4½ inches broad. Scapes basal, stout, erect, 1¾ feet high; raceme thirteen-flowered with about six sheathing striate bracts below; the flowering bracts ovate-elliptic, acute, pale green, ¾—1 inch long. Flowers 2 inches in diameter; sepals and petals spreading, sub-equal, elliptic-oblong, acute, reddish brown with nearly white base, the lateral sepals carinate, the petals a little narrower. Lip articulated to the short foot of the column, straw-yellow with radiating dark purple lines, deeply three-lobed, the side lobes broadly rounded; the front lobe narrowly linear, acute; crest basal with a pair of free spreading arms forming a crescent, bright yellow with numerous dark spots. Column somewhat elongate, sub-clavate, cream-white; wings obsolete."—Rolfe in Gard. Chron. VIII. s. 3 (1890), p. 7.

Moorea irrorata, Rolfe in Gard. Chron. loc. cit.; and XI. s. 3 (1892), p. 489, with figs. *Bot. Mag.* t. 7262.

Nothing has been divulged respecting the origin of this orchid. "It was probably imported by Messrs. Shuttleworth and Co. from the Andes of New Granada or Peru, these gentlemen having sent a flowering raceme together with a leaf to Kew, in December, 1889, a few months before others were received from Mr. Moore, though the fact was not known until later."* The specific name is given in allusion to the bright reddish brown colour, which forms a broad zone round the paler centre.



Moorea irrorata.
(From the *Gardeners' Chronicle.*)

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* Bot. Mag. sub. t. 7262.

PERISTERIA.

Hook. in Bot. Mag. t. 3116 (1831). Benth. et Hook. Gen. Plant. III. p. 550 (1883).

In Peristeria the flowers appear more regular in outline than in the Stanhopeids described in the preceding pages. This is owing to the sepals and petals being more or less connate at the base; they are also very fleshy and convex on the outer side, imparting to the flower an almost globose form. Moreover, the labellum is of simpler structure; this organ, like the other segments, is of fleshy texture, three-lobed, continuous with the column and articulated at the middle. The column itself is short, thick and mostly wingless; the pollinia are sessile or sub-sessile, and furrowed on one side.

The species that conform to these characters are about eight in number, of which three or four are but very imperfectly known. Those here noticed are all more or less robust plants with large pseudo-bulbs and long plaited leaves; in this respect the type species *Peristeria elata* is one of the largest pseudo-bulbous orchids in cultivation.

The generic name is formed from the Greek word περίστερα, "a dove," selected for the reason given under *Peristeria elata.*

Peristeria cerina.

Pseudo-bulbs ovoid-oblong, 3 inches long, bearing at their apex 3—4 oblong-lanceolate leaves, 7—10 inches long, narrowed below into a short channelled petiole. Scapes short and pendulous, sheathed at the base by brownish, ovate, imbricating scales; raceme dense, 7—10 flowered. Flowers about an inch in diameter, light citron-yellow; sepals and petals of wax-like texture, broadly ovate, sub-acute, concave within, the petals a little smaller than the sepals; lip three-lobed, the side lobes ovate, acute, the intermediate lobe ovate, emarginate, abruptly inflexed and with crisped margin. Column thick, semi-terete.

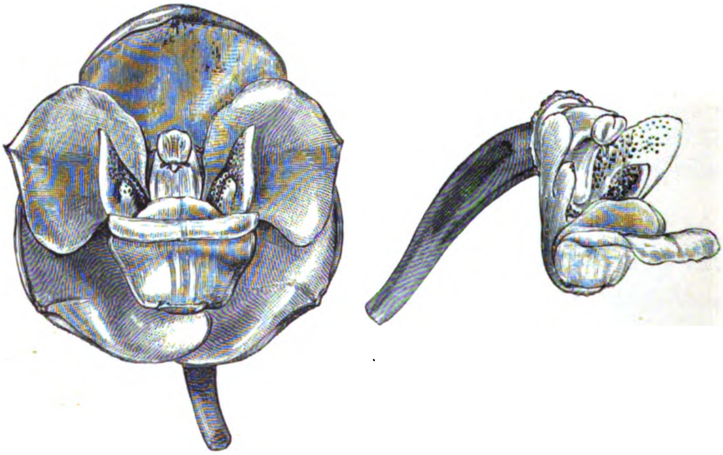
Peristeria cerina, Lindl. in *Bot. Reg.* t. 1953 (1837). Rchb. in Walp. Ann. VI. p. 607.

Introduced from Central America in 1837 by our predecessor Mr. Knight, of the Royal Exotic Nursery, the precise habitat not being recorded. It is one of the least attractive of the Peristerias, more resembling *Peristeria pendula* than the type species *P. elata;* the flowers have a strong odour of the bruised foliage of Juniper. Our description was taken in the Royal Gardens at Kew.

P. elata.

Pseudo-bulbs sub-conic or broadly ovate, 6 inches long, and 3—4 inches broad near the base. Leaves lanceolate-cuneate, acute, 24—36 or more inches long, prominently nerved beneath. Scapes 4—5 feet high, with an ovate, acuminate, keeled bract at each joint and a similar smaller one at the base of each ovary; raceme 10—15 or more flowered. Flowers fleshy, globose, 2½ inches in diameter, very fragrant; sepals and petals French-white, concave within, the dorsal sepal broadly ovate, obtuse, the lateral two sub-orbicular; the petals obovate-oblong, obtuse, smaller than the sepals; lip three-lobed, the side lobes ascending, oblong, obtuse, with a lobule on the anterior side above the middle, white spotted with purple; the front lobe sub-quadrate, retuse, almost truncate, with a fleshy orbicular crest. Column terete above, concave below the stigma, anther beaked.

Peristeria elata, Hook. in *Bot. Mag.* t. 3116 (1831). Lindl. Gen. et Sp. Orch. p 160. Rchb. in Walp. Ann. VI. p. 607. Jennings' *Orch.* t. 44. Williams' *Orch. Alb. VII.* t. 327.



Peristeria elata.

This stately orchid has long been known as the Dove Plant from the fancied resemblance of the column and its beaked anther, combined with the ascending side lobes of the lip to the figure of a Dove; characters which also obtained for it from the Spanish settlers in Central America the name of El Espiritu Santo or Holy Ghost plant. It is a native of Panama, whence it was first communicated in 1826 by Mr. Barnard, a Peruvian merchant, to Mr. Harrison, of Liverpool, in whose stove it flowered for the first time in this country in 1831. Like *Phaius grandifolius, Dendrobium nobile* and other popular kinds, it is one of the few orchidaceous plants generally cultivated in the stove without being especially associated with other orchids, its stately habit and curious, fragrant flowers rendering it popular among amateurs who possess the needful accommodation for its culture.

Cultural Note.—Peristeria elata is usually potted early in spring in a compost of two-thirds well-rotted turfy loam, and one-third fibrous peat with the addition of some thoroughly decomposed cow manure. Ample drainage should be secured by broken crocks to about half the depth of the pot, and the compost filled in above this to within an inch of the rim. The pseudo-bulbs should be placed on the surface of the compost which should then be covered with sphagnum moss. When growth commences the plants should receive a liberal supply of water which should be continued till the large new pseudo-bulbs are mature; the supply may then be diminished to so much as is sufficient to prevent the pseudo-bulbs from shrinking during the winter months. As much air and light as is safely practicable should be afforded at all seasons, shading being used only during the earliest stages of growth and on hot bright days to prevent the foliage being scorched.

P. pendula.

Pseudo-bulbs sub-conic, compressed, elongated, 4—6 inches long. Leaves 3—4 from the apex of the pseudo-bulbs, lanceolate, acute, 12—15 inches long. Scapes stoutish, pendulous, 5—7 inches long, bearing a dense cluster of fragrant flowers of wax-like texture; bracts small, scale-like, brownish red. Flowers globose, 2 inches in diameter, French-white spotted with purple; sepals and petals broadly oval-oblong, obtuse, concave on the inner side, the dorsal sepal a little longer than the other segments; hypochile of lip oblong with two quadrate basal lobes between which are two erect fleshy plates; epichile or front lobe tongue-shaped, deeply grooved along the centre, reflexed at the apex. Column very broad, semi-terete, concave below the stigma, and with two incurved oblong wings.

Peristeria pendula, Hook. in *Bot. Mag.* t. 3479 (1836). Lindl. in Bot. Reg. 1843, misc. No. 99. Rchb. in Walp. Ann. VI. p. 607.

Originally imported from Demerara by Mr. John Allcard, in whose stove at Stratford Green it flowered for the first time in this country in January, 1836. It was afterwards detected by the brothers Schomburgk during their exploration of British Guiana, who state that it is generally dispersed over the whole region, flowering in November and December. Although inferior to the Dove Plant as a horticultural subject, it is a remarkable species worthy of a place in large collections.

ACINETA.

Lindl. in Bot. Reg. 1843, misc. p. 67. Benth. et Hook. Gen. Plant. III. p. 551.

The technical distinction between Peristeria and Acineta rests chiefly on the characters of the labellum and pollinary apparatus; in the first-named organ there is no articulation at the middle, and the pollinia are not sessile but have a narrow stipes or caudicle. Besides these the flowers are somewhat differently shaped on account of the looser arrangement of the sepals. In addition to the species here described, three or four others are known to science, making up the number to about seven or eight, all natives of tropical America from Southern Mexico to Colombia.

The jointless immovable condition of the front lobe of the labellum suggested the generic name which is derived from ἀκίνητος, "immovable."

Cultural Note.—Like the Peristerias the Acinetas are robust plants with large pseudo-bulbs, large plaited leaves and with a stout, many-flowered inflorescence that is more or less pendulous. They require a high temperature, such as is maintained in the East Indian house, and on account of their pendulous inflorescence they should be suspended near the roof when in flower. In other respects their cultural treatment is the same as for Peristeria and allied genera.

Acineta Barkeri.

Pseudo-bulbs pyriform or sub-conic, 4—6 inches, strongly ribbed and angulate, di-triphyllous. Leaves broadly lanceolate, acute, plaited, 20—25 inches long. Racemes pendent, 12—15 inches long, 10—15 flowered; bracts sheathing, ovate, acute greenish brown. Flowers fragrant, sub-globose, 1½ inch in diameter, bright yellow with a sanguineous spot on the lip, and a few red spots at the base of the petals; sepals oblong, acute, concave, the lateral two a little broader than the dorsal one; petals sub-similar, oval; lip with a channelled fleshy claw, three-lobed, the side lobes large, incurved, broadly halberd-shaped, and with a large fleshy disk between them: the intermediate lobe much smaller, narrowly oblong, retuse, concave, keeled beneath. Column semi-terete, pubescent, with a very narrow wing on each side of the stigma.

Acineta Barkeri, Lindl. in Bot. Reg. 1843, misc. p. 68. Paxt. *Mag. Bot. XIV.* p. 145. Rchb. in Walp. Ann. VI. p. 611. Peristeria Barkeri, Batem. *Orch. Mex. et Guat.* t. 8. *Bot. Mag.* t. 4203.

Originally discovered by Ross in a dark ravine in the neighbourhood of Xalapa in Mexico, in 1837, and sent by him to Mr. Barker, in whose garden at Springfield, near Birmingham, it flowered in the following year. It was a great favourite with the orchid amateurs of that period, and it is still occasionally seen.

A. densa.

Pseudo-bulbs narrowly fusiform or sub-conic, 3—4 inches long, bearing at their apex 3—4 oblanceolate, acute, plaited leaves, 12—18 inches long. Racemes 2—3 feet long, pendulous, many-flowered; bracts oblong, acute, brownish. Flowers fragrant, not fully expanding; sepals light yellow, concave, oval-oblong, obtuse, the lateral two a little longer than the dorsal one; petals similar to the dorsal sepal but smaller, light yellow spotted with red, the spots aggregated towards the base; lip very fleshy, yellow densely spotted and blotched with red-brown; the claw nearly quadrate, concave with a conical protuberance on the front side; the side lobes oblong-rotund, erect, concave; the intermediate lobe much smaller, oblong, slightly incurved; disk a fleshy plate with a raised median line, tridentate in front. Column stoutish, pubescent with two rounded wings.

Acineta densa, Lindl. in Paxt. Fl. I. p. 91, with fig. *Fl. Mag.* 1861. t. 16. Rchb. in Walp. Ann. VI. p. 610. *Bot. Mag.* t. 7143. A. Warscewiczii, Klotzsch, Allg. Gartenz. 1852, p. 145.

A native of Turialba, in Costa Rica, where it was discovered in 1819 by Warscewicz, from whom it was obtained by Mr. G. Ure Skinner for the Horticultural Society of London and for some of the most prominent orchid amateurs of that period including Bishop Sumner, in whose collection at Farnham Castle it seems to have flowered for the first time in this country, but not till several years after its introduction. It flowered simultaneously in the Royal Gardens at Kew and Glasnevin in the autumn of 1889, whence we obtained materials for description. As a species it is comparable with *Acineta Barkeri*, to which it is superior in its larger, more open and brighter coloured flowers; but it is, unfortunately, a shy bloomer and it has now become quite rare in the orchid collections of this country.

A. Humboldtii.

Pseudo-bulbs ovoid, angulate, 3—4 inches long, di-triphyllous. Leaves lanceolate, acute, 10—15 inches long, 1—2 inches broad, narrowed below into a channelled foot-stalk, strongly nerved beneath. Scapes stoutish, as long as the leaves, quite pendulous, 5—7 or more flowered; bracts ovate, acute, sheathing, half as long as the ovaries. Flowers not fully expanding, faintly but pleasantly fragrant; 2—2½ inches in diameter; sometimes reddish brown, sometimes light tawny yellow, but always spotted with red or brown-purple; dorsal sepal broadly oblong, concave; the lateral sepals larger, obliquely ovate, obtuse, connate and gibbous at the base; petals much smaller than the sepals, oval, almost sub-rhomboid; lip somewhat boat-shaped, deeply three-lobed, the side lobes large, sub-rotund, incurved, with a projecting lobule on the inner side; the intermediate lobe ovate, obtuse, with a two-lobed blackish purple crest near its base. Column short and thick with narrow rounded wings, whitish and pubescent above, concave and spotted with red below the stigma.

Acineta Humboldtii, Lindl. in Bot. Reg. 1843, misc. p. 67. Van Houtte's *Fl. des Serres, X.* t. 992. A. superba, Rchb. in Walp. Ann. VI. p. 609.* Peristeria Humboldtii, Lindl. in *Bot. Reg.* 1843, t. 18. *Bot. Mag.* t. 4156 (fulva). Anguloa superba, H. B. K. Nov. Gen. et Sp. I. p. 343, t. 93. Lindl. Gen. et Sp. Orch. p. 160.

The botanical history of this fine orchid may be thus summarised:—

According to Dr. Lindley it was discovered by the great traveller Humboldt and his companion Bonpland growing on trees in the temperate parts of Tumbez near Zaruma in Peru (now Ecuador), and in a valley called Catacocha; it was also found by them cultivated in a garden at Loxa at 6,000—7,000 feet elevation. The description and figure of the plant in Humboldt and Kunth's *Nova Genera et Species Plantarum* caused a desire, even in the early days of orchid culture, to see it in European gardens, and the surprise was great when Dr. Lindley announced that the plant figured in the *Botanical Register* as *Peristeria Humboldtii* was without doubt the *Anguloa superba* of Humboldt, in whose figure, however, the raceme is made to grow erect instead of pendulous. The first living plant seen in England was imported by Mr. Wilmore, of Oldford, near Birmingham, not, however, from Ecuador, but from Porto Cabello in Venezuela, many hundreds of miles distant, and it flowered in his garden in March, 1842, and was figured in the *Botanical Register* as *Peristeria Humboldtii*. Subsequently the late Professor Reichenbach saw or possessed specimens of this species gathered by Wagener in Caracas, and by Schlim near Ocaña; and it is probable that the plants cultivated of late years originated in that region. Although there is nothing improbable in the same species of orchid occurring in localities 1,000 miles apart, it is a curious circumstance that the Ecuadorian origin of *Acineta Humboldtii* does not appear to have been confirmed by its re-discovery in that country.

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* *Superba* is the oldest specific name of this plant, but we prefer following the far more convenient usage of adopting the oldest name under the right genus. Lindley, doubtless, rejected *superba* on account of its indefinite meaning, and also from a desire to honour the discoverer of this orchid.

MORMODES.

Lindl. Nat. Syst. Bot. Ed. II. 446, ex Bot. Reg. XXII. t. 1861 (1836). Benth. et Hook. Gen. Plant. III. p. 552 (1883).

Mormodes is one of a group of genera characterised by fleshy stems and strange-looking flowers.* Dr. Lindley long ago graphically remarked of this group of orchids, "that we find among them the most astonishing deviations from ordinary structure and the most startling variations from what appears to be the rule in other parts of the organic world." All this still holds good but in a modified sense, for many of the deviations in form and structure occurring in Mormodes, Catasetum and Cycnoches that were inexplicable puzzles to Lindley and his contemporaries have since been shown to be not mere "freaks" or "sports" of nature, but necessary conditions of the plant's organisation, probably evolved from a simpler state in the course of a long series of ages.

The most striking floral peculiarities in Mormodes are seen in the column and lip, especially in the first-named organ, which is twisted one-quarter round so as to cause the anther to face sideways; the beak of the column, or rather the small hinge by which the anther case is articulated with the column is so sensitive that when the beak is touched ever so lightly, the whole of the pollinary apparatus is released and tossed upwards with a jerk to some distance. The labellum too is a remarkable organ, and although a polymorphous one it always has the same relative position to the column, that is, it is bent upwards and inwards and arches more or less over it.

That this curious contrivance serves an important end in the perpetuation of the plant is shown conclusively by Darwin in his *Fertilisation of Orchids.*† Space does not permit us to reproduce here the lucid explanation given by that eminent naturalist of the various parts of the flower and the means by which fertilisation is effected; we must therefore refer the reader to the place quoted, and which will be found to be not the least interesting part of that remarkable work.

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* The group of genera alluded to in the text includes Catasetum. This very extraordinary genus was for a long time the puzzle and astonishment of botanists on account of its unisexual and dimorphous flowers, circumstances at first not even suspected in an orchid. The true characters of Catasetum have since been gradually brought to light as new species were introduced and their flowers studied. Nevertheless, very much yet remains to be investigated, for even the extent of the genus is practically unknown, and the sexual states of not more than a dozen of the whole number of species have been studied. Moreover, the species introduced from time to time into European gardens have hitherto proved intractable and short-lived under cultivation. For these reasons we are not yet prepared to deal with the genus for this work.

† Chap. VI. pp. 249—265.

In their vegetation the Mormodes so closely resemble the Catasetа as to be scarcely distinguishable from them when not in flower. To avoid needless repetition, the general statement here given applies to all the species described in the following pages.

The *stems* are pseudo-bulbous, usually fusiform, more or less compressed and sheathed by the broad membraneous leaf bases.

The *leaves*, 5—7 or more to each pseudo-bulb, are narrowly lanceolate but sometimes broader, acuminate, plaited and prominently nerved on the under side.

The *scapes* are stoutish and racemed; the raceme is lax in the large-flowered and dense in the small-flowered species.

The number of species at present known exceeds a dozen, which are confined to a comparatively small portion of tropical America, extending from southern Mexico to northern Colombia. The generic name is derived from the Greek word *μορμὼ*, "a phantom or any frightful-looking object," in allusion to the strange appearance of the flowers.

Cultural Note.—Nearly all the species of Mormodes here noticed have been introduced from mountainous regions at a considerable elevation, and it has thence been found that they may be safely cultivated under nearly the same conditions as the Cattleyas of the *labiata* group. As the Mormodes are deciduous plants and have a decided season of rest followed by a season of active growth, they require all the light obtainable in our climate to mature their pseudo-bulbs. The compost should consist of the usual proportion of peat and sphagnum with ample drainage and water freely given during the growing season.

Mormodes Buccinator.

Pseudo-bulbs 5—7 or more inches long. Leaves 8—12 inches long. Scapes longer than the leaves; racemes more or less lax, 7—10 flowered; bracts small, acuminate. Flowers the most polymorphous and the most variable in colour yet seen in the genus; in the typical form the sepals and petals are pale green and the lip white; in other forms the colour varies from buff to pale straw-yellow, sometimes striped and spotted in different ways; sepals and petals narrowly oblong, acute, the sepals reflexed, the petals bent forward over the column; lip obovate, with the sides rolled back and almost meeting at their edges. Column semi-terete with the usual oblique twist.

Mormodes Buccinator, Lindl. in Bot. Reg. 1840, misc. No. 9; and 1841, misc. No. 191. Rchb. in Walp. Ann. VI. p. 578. Rchb. in Gard. Chron. XIV. (1880), p. 358 (major). Rolfe in Gard. Chron. VI. s. 3 (1889), p. 731. M. lentiginosum, *Bot. Mag.* t. 4455. M. flaveolum, M. vitellinum, M. Wagenerianum, M. brachystachium, M. leucochilum and M. marmorea, Klotzsch, ex. Rchb. in Walp. Ann. VI. loc. cit.

This remarkable Mormodes was first communicated to Dr. Lindley by Mr. Wilmore, of Oldford, near Birmingham, in 1840, without, it appears, giving any indication of its origin. We next read of its being imported by Messrs. Loddiges from La Guayra, the port of Caracas, and according to Reichenbach it was afterwards gathered by Schlim, Wagener and Warscewicz in north-west Venezuela. It is occasionally imported from that region, and it is one of the species of Mormodes most frequently seen in British collections.

The specific name Buccinator, "a trumpeter," refers to the curious trumpet-like labellum.

M. Cartonii.

Pseudo-bulbs 5—7 inches long. Leaves 12—15 inches long. Scapes half as long as the leaves, densely racemed above the middle. Flowers with a faintly pleasant fragrance, 1½ inch across, yellow sometimes striped and spotted with red; sepals and petals nearly uniform, lanceolate, acute, spreading; lip irregularly oblong, obliquely twisted into half a circle, the acute apex meeting the awl-shaped point of the anther, the column being similarly twisted and bent.

Mormodes Cartonii, Hook. in *Bot. Mag.* t. 4214 (1846). Lindl. in Paxt. Fl. Gard. III. sub. t. 93 (1857). Gard. Chron. 1871, p. 447, with fig.

Discovered by Purdie, in 1842, on the Sierra Nevada of Santa Martha in northern Colombia, and sent by him to the Royal Gardens at Kew. It flowered for the first time in this country in 1845, in Syon House Gardens, and is named after Mr. Carton, at that time gardener to the Duke of Northumberland. It is closely allied to the preceding species, from which it is chiefly distinguished by its longer and more slender pseudo-bulbs and leaves, its denser racemes of smaller and differently coloured flowers, and especially by its narrower and more acute lip and awl-shaped appendage of the anther.*

M. Colossus.

"Pseudo-bulbs 6—12 inches long. Leaves elliptic-ovate, acute, plaited. Scape 2—2½ feet long, racemose along the distal half;

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* It is also very near *Mormodes igneum*, a native of the same region, introduced by Warscewicz and figured in Paxton's *Flower Garden*, a species we have not seen. Of these three plants (*M. Buccinator*, *M. Cartonii*, and *M. igneum*) Dr. Lindley remarked that it is not improbable that they are one and the same species, for beyond colour there is not much to distinguish them, and it is no doubt that species which travellers report to have seen growing in the temperate parts of the snow-capped mountain ridges of Santa Martha, especially on the branches of an Erythrina (Paxt. Fl. Gard. loc. cit.). This is doubtless true as regards *M. Buccinator* and *M. igneum*, but *M. Cartonii* is certainly distinct from the first-named species.

cauline bracts short, triangular, appressed; floral bracts lanceolate, shorter than the pedicels. Flowers among the largest in the genus, 5—6 inches across the lateral sepals; sepals and petals narrowly lanceolate, acuminate with recurved margins, the basal half light rose with darker parallel nerves, the apical half bright yellow; lip shortly clawed, ovate-cordate, acuminate, incurved, the margins revolute and almost meeting at the back, bright yellow with some red dots towards the base and tip."—*Botanical Magazine.*

Mormodes Colossus, Rchb. in Bot. Zeit. 1852, p. 636. Id. in Walp. Ann. VI. p. 581. *Bot. Mag.* t. 5840.

Introduced by Warscewicz about the year 1850 from the mountains of Central America at an elevation of 6,000—7,000 feet, and subsequently imported by ourselves from the same region. It has now become very rare in the orchid collections of Europe, if it has not entirely disappeared from them.

M. Greenii.

"Pseudo-bulbs 3—4 inches long. Leaves 12—18 inches long. Racemes large, pendulous, many-flowered. Flowers 2½ inches in diameter, whitish externally; sepals and petals ovate, sub-acute, concave, light yellow entirely covered with oblong dark red spots; lip curved upwards, gradually dilated from a linear fleshy base to a saccate, incurved, orbicular apex, irregularly toothed on the margin; base of lip dark purple, inner surface yellow with red streaks, outer surface spotted like the sepals and petals except on the dilated apex which is dull lilac. Column short and curved, anther acuminate."—*Botanical Magazine.*

Mormodes Greenii, Hook. f. in *Bot. Mag.* t. 5802 (1869).*

One of the finest species in the genus; the flowers are not only large and handsomely coloured, but they also exhale a powerful aromatic odour. Its origin is not known with certainty, although probably Colombian. The first recorded instance of its flowering in this country was in the collection of the late Mr. Wilson Saunders at Hillfield, Reigate, in 1869, and after whose gardener, Charles Green, it is named.

M. luxatum.

Pseudo-bulbs 6—8 inches long. Leaves 15—20 inches long. Scapes longer than the leaves, stoutish, glaucous, 9—12 or more flowered; bracts short, broadly subulate. Flowers 3—3½ inches in diameter, strongly fragrant; sepals and petals yellowish green sometimes spotted with purple; the sepals ovate, sub-acuminate; the petals much broader, oval-oblong, acute, concave; lip shortly clawed, and twisted in the same manner as the column, obscurely three-lobed, sub-orbicular, concave, almost hemispheric, with an apiculus on the anterior edge; deeper in colour than the sepals and petals, and with a brown-purple streak on the inner side. Column triquetral with the characteristic twist of the genus.

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* In the *Gardeners' Chronicle*, 1869, p. 1205, the late Professor Reichenbach reduced this species to his *Mormodes uncia* described in the same volume at p. 892, and which he states is a Mexican species that had been introduced by ourselves, but of which we possess no record. Reichenbach's short Latin diagnosis of *M. uncia* is so greatly at variance with *M. Greenii* that we are unable to accept them as one and the same species.

Mormodes luxatum, Lindl. in *Bot. Reg.* 1842, misc. No. 66; and 1843, t. 33. Rchb. in Walp. Ann. VI. p. 577. Id. in Gard. Chron. X. (1878), p. 396. *Rev. hort.* 1889, p. 132, with plate. Rolfe in Gard. Chron. VI. s. 3 (1889), p. 186. Catasetum luxatum, Benth. in Gen. Plant. III. p. 552.

sub-var.—*eburneum* (Gard. Chron. XVIII. (1882), p. 144, with fig.), flowers ivory-white with a brown-purple stripe on the lip.

The original *Mormodes luxatum* is more acceptable for the delightful fragrance than for the colour of its flowers which is dull lemon-yellow; in the sub-variety the colour is much purer, rendering the flowers quite handsome. The typical form was discovered by Ross in 1839 near Valladolid, in Mexico, while collecting orchids for Mr. George Barker, of Birmingham, in whose collection at Springfield it flowered in 1842. The sub-variety seems to have first appeared in the collection of Sir Trevor Lawrence, Bart., who mentions it in the *Gardeners' Chronicle* of 1878 as "a stately plant, delicate in the pure ivory tint and scent of its flowers, and quaint in its twisted shell-shaped lip."*

M. Ocannæ.

"Pseudo-bulbs 3—4 inches long. Leaves about a foot long. Scapes robust, about as long as the leaves, 6—10 flowered; bracts oblong, obtuse, boat-shaped, ½ inch long. Flowers about 3 inches in diameter when spread out, uniformly of a dark orange-yellow closely speckled with red-brown spots; sepals and petals similar, lanceolate, acuminate, concave; lip with a long claw, the blade three-lobed, the lateral lobes short, oblong, rounded at the tip; the mid-lobe sub-quadrate, abruptly beaked, all the lobes with incurved margins."—*Botanical Magazine.*

Mormodes Ocannæ, Lindl. et Rchb. MSS. in Walp. Ann. VI. p. 581 (1863). Rchb. in Gard. Chron. XII. (1879), pp. 582 and 816, with figs. *Bot. Mag.* t. 6496.

Originally discovered by Schlim on the eastern Cordillera of Colombia, near Ocaña, at 4,000—5,000 feet elevation, from whose dried specimen it was described by Reichenbach in Walper's *Annales Botanices.* It was re-discovered by Kalbreyer while collecting orchids for us in that region, and who sent us the first living plants received in Europe, one of which flowered magnificently in our houses in October, 1879, and was figured in the *Botanical Magazine* and *Gardeners' Chronicle.*

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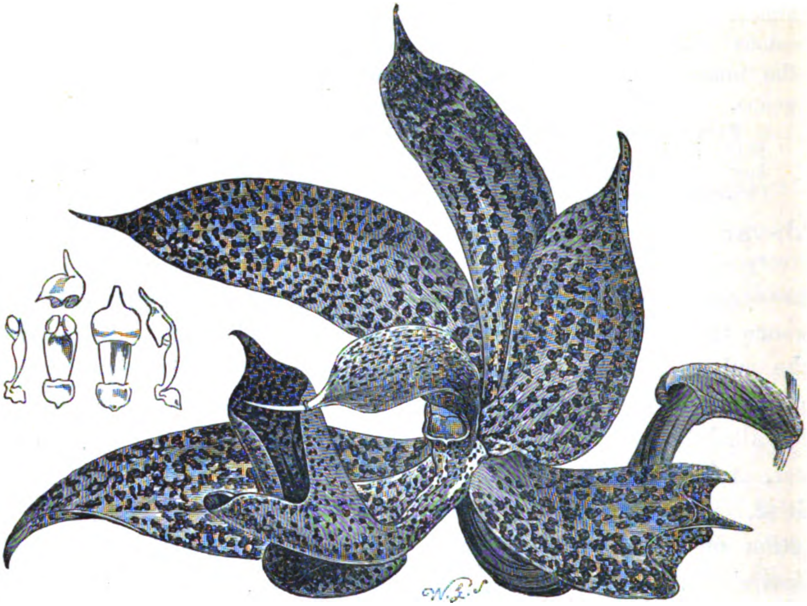
* Vol. X. p. 396.



Mormodes Ocannæ.
(From the *Gardeners' Chronicle.*)

M. pardinum.

Pseudo-bulbs 5—6 inches long. Leaves 12—15 or more inches long. Scapes as long as the leaves, arching, the raceme dense and many-flowered; bracts small, ovate, acuminate. Flowers with a faint odour of Turkish rhubarb, sub-secund, light tawny yellow densely spotted with chocolate-red; sepals and petals similar and sub-equal, ovate, acuminate, incurved; lip a little smaller than the other segments, three-lobed; all the lobes acuminate, the intermediate one the largest.

Mormodes pardinum, Batem. *Orch. Mex. et Guat.* t. 14. Lindl. in Bot. Reg. XXIV. misc. No. 176; and XXIX. sub. t. 33. *Bot. Mag.* t. 3900. Rchb. in Walp. Ann. VI. p. 582. Knowles and Westc. *Fl. Cab.* t. 113. Williams' *Orch. Alb. VII.* t. 330.

sub-var.—*unicolor* (*Bot. Mag.* t. 3879), flowers bright lemon-yellow wholly destitute of spots.

A native of the Mexican province of Oaxaca, originally discovered in 1836 by Karwinsky, and communicated by him to Mr. Bateman, in whose collection at Knypersley it flowered in July, 1838. It was shortly afterwards collected for Mr. Barker by Ross, in whose consignment the variety *unicolor* first appeared. It is one of the best known Mormodes in British collections.

CYCNOCHES.

Lindl. Gen. et Sp. Orch. p. 154 (1832). Benth. et Hook. Gen. Plant. III. p. 552 (1883).

Still more curious than Mormodes is the genus Cycnoches or "Swan's-neck" orchids as the name implies, which like Catasetum have unisexual flowers, but which in some species are so strangely dimorphic that before their true character was understood the plants that produced them were referred to different species; and when both kinds appeared on the same plant, which was and is still a comparatively rare occurrence in the cultivated state, such was regarded as a "sport" or "inexplicable puzzle."* Our knowledge of the genus is still very imperfect, but what is known of it is well summarised by Mr. Rolfe in recent articles published in the *Gardeners' Chronicle* and elsewhere which the reader will find well worth perusal.† In these articles it will be seen that the author has succeeded in solving the phenomena of dimorphism, which until recently seemed an almost inextricable puzzle. He has shown that Cycnoches, like the allied genus Catasetum, has diœcious flowers. In the male the ovary is abortive and slender; the column is long and slender with perfect pollinia and no stigma; while in the female the ovary is stout and perfectly developed, the column is short and stout, without pollinia but with a perfect stigma situated between a pair of fleshy wings. The perianth is also dimorphic, but strange to say, this character does not apply to all the species. The genus thence comprises two very distinct groups—EUCYCNOCHES, so called because it includes the original species of genus, and in which the perianth scarcely differs in the two sexes; and HETERANTHÆ, in which it is very dissimilar especially in the lip. The former contains *Cycnoches chlorochilon*, *C. Haagei*, *C. Loddigesii*, *C. ventricosum* and *C. versicolor;* the latter *C. aureum*, *C. Egertonianum*, *C. glanduliferum*, *C. maculatum*, *C. pentadactylon*, *C. peruvianum*, *C. Rossianum* and *C. Warscewiczii.*

The floral characters of Cycnoches will be further understood from the descriptions that follow. In their vegetative organs the species so closely resemble Mormodes and Catasetum, and differ so little *inter se* that the description of them under *C. chlorochilon*, the best known species, will serve for all. Like Mormodes, too, the Cycnoches are all natives of tropical America, but evidently more dispersed. Unfortunately scarcely anything has been communicated respecting their station and environment in their native countries, but experience has shown that the cultural treatment best suited for them is similar to that formulated under Mormodes.

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* A good illustration of a monœcious plant of Cycnoches is given in the second series of the *Floral Magazine*, plate 381, and reproduced in Pfitzer's *Grundzüge*.

† Vol. VI. s. 3 (1889), p. 188; X. (1891), p. 69; and XI. s. 3 (1892), p. 204; also *Garden and Forest*, 1892, p. 88. So few species of Cycnoches are cultivated in the orchid collections of this country that materials for examination are seldom forthcoming, and from this cause we have been unable to deal with this extraordinary genus so fully or so satisfactorily as we could wish. The species described in the text are well deserving the attention of cultivators.

Cycnoches aureum.

Male flowers: Racemes pendulous, rather dense, 9—12 flowered. Flowers 2—3 inches in diameter, of a uniform clear yellow; sepals and petals similar and sub-equal, broadly lanceolate, acute; the sepals spreading, the petals much reflexed beyond the middle; lip clawed with an ovate, acute blade, "the edge of which is broken up into short curved processes forked at the point," the two lowermost larger than the others and turned backwards. Column slender with the characteristic curve of the genus.

Cycnoches aureum, Lindl. in Paxt. *Fl. Gard. III.* t. 75 (1853).

Introduced in 1852 from Central America by Mr. G. Ure Skinner, but long since lost to cultivation. It is, without doubt, a very handsome species well worth re-introduction.

C. chlorochilon.

Stems cylindric, tapering upwards, 4—7 or more inches long, sheathed by the persistent bases of the fallen leaves. Leaves 5—8 to each stem, lanceolate, acute, plaited, strongly nerved beneath. Scapes stoutish, 1—3 or more flowered. Flowers inverted, variable in size, the largest 6 inches across vertically; sepals and petals yellowish green, the dorsal sepal lanceolate-oblong, acute, curved, the lateral two much broader; the petals similar to the dorsal sepal and sub-falcate; lip obovate or elliptic oblong, acute, with a ventricose disk below which is a dark green depression, and near the base a triangular, erect callus. Column curved like a swan's neck in both sexes; in the male flower slender, dilated below the anther; in the female flower thicker and shorter with a triangular fleshy wing on each side of the stigma.

Cycnoches chlorochilon, Klotzsch in Allgem. Gartenz. 1838, p. 225. Lindl. *Sert. Orch.* t. 16. Rchb. in Walp. Ann. VI. p. 560. Williams' *Orch. Alb. VI.* t. 263. Gard. Chron. III. s. 3. (1888), p. 145, icon. xyl. *Illus. hort. XXXV.* t. 65. Sander's *Reichenbachia, I.* s. 3. t. 39. Rolfe in Gard. Chron. X. s. 3 (1891), pp. 69 and 394.

Originally discovered by Moritz, a German naturalist settled in Venezuela, who sent specimens from Maracaybo to the Berlin Museum in 1836, from which the species was described two years later by Professor Klotzsch in Otto and Dietrich's *Allgemeine Garten-*

zeitung. About the same time it was imported from Demerara by Messrs. Loddiges, in whose nursery it flowered for the first time in England, and on which occasion the excellent figure in Lindley's *Sertum Orchidaceum* was drawn.

Cycnoches chlorochilon is the best known species of the genus in cultivation, its large fragrant flowers securing for it a place in many orchid collections. But although it has been in European gardens for more than half a century, the appearance of female flowers does not seem to have been recorded or even observed till quite recently. In July, 1891, M. Houzeau de Lehaie, of Hyon, near Mons, sent to Kew a male and a female flower gathered from distinct plants that had been received from Caracas, the Venezuelian habitat of the species; the difference between the two forms is thus pointed out by Mr. Rolfe:—

> "The male is the form so long known in gardens with slender column and pollinia normally developed; the female is distinctly larger and more fleshy than the male and with broader sepals and petals; the ovary is more than twice as thick as the pedicel of the male flower and more strongly grooved; the column is scarcely half as long, but it is at least four times as thick; there are, of course, no pollinia but a well-developed stigma with a pair of large fleshy incurved wings on either side. The colour of the flowers is identical in the two sexes."*

C. Egertonianum.

Male flowers: Racemes pendulous, 12—15 inches long, many-flowered. Flowers about 1½ inch in diameter; sepals and petals lanceolate, acute, the petals a little broader than the sepals, lurid purple, greenish at the back; lip with a narrow excavated claw and circular blade broken up into about ten clavate purple processes and two longer and broader green ones that are nearly parallel with each other. Column very slender, purple; anther green. *Female flowers:* Solitary or in pairs on a short, sub-erect raceme, dull olive-green, rather larger and more fleshy, but otherwise similar to the male flowers except in the lip which is cordate acute, entire, and in the sexual organs.

Cycnoches Egertonianum, Batem. Orch. Mex. et Guat. sub. t. 40 (1843), in part. Lindl. Bot. Reg. 1843, misc. p. 77, with fig. Rolfe in Gard. Chron. XI. s. 3 (1892), p. 204.

The earliest authentic notice of this curious species being in cultivation occurs in the miscellaneous matter of the *Botanical Register* of 1843, where a figure of a raceme with both male and female flowers—an extremely rare occurrence in Cycnoches—is given. The plant that produced it was in the collection of the late Mr. R. S. Holford, at Westonbirt, in Gloucestershire, which had been acquired from Messrs. Rollisson, of Tooting. Dr. Lindley mistook the phenomenon for a sport of a different species, *Cycnoches ventricosum,* which Mr. Bateman had figured in his *Orchidaceæ of Mexico and Guatemala* under the name of *C. Egertonianum,* whence arose an indescribable confusion and many "sensational" things were written concerning it, as the sexual dimorphism of Cycnoches was then unknown.

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* Gard. Chron. X. s. 3 (1891), p. 69.

We are indebted to Sir Trevor Lawrence, Bart., for the raceme of male flowers described above and which were very richly coloured. The species was dedicated to Sir Philip Egerton, a zealous patron of horticulture and the possessor of an excellent collection of orchids.

C. Loddigesii.

Stems and leaves as in *Cycnoches chlorochilon.* Racemes pendulous, as long or longer than the stems, 5—7 or more flowered. Male flowers large and fragrant; sepals and petals greenish brown obscurely spotted with brown, the dorsal sepal linear-oblong, acute; the lateral sepals and petals broadly lanceolate, acute, sub-falcate; lip narrowly oblong, sub-acuminate, fleshy, and convex, the basal half whitish, the apical half yellow, the whole surface sparingly spotted with red. Column long, slender, incurved, dark purple; the anther yellow-green spotted with purple.

Cycnoches Loddigesii, Lindl. Gen. et Sp. Orch. p. 154 (1832). Id. in *Bot. Reg.* t. 1742. *Bot. Mag.* t. 4215. Rchb. in Walp. Ann. VI. p. 559.

The above description is that of the male flowers; the female flowers we have not seen, but they appeared soon after the introduction of the species in the collection of Mr. Wilmore at Oldfield, near Birmingham, who sent one to Dr. Lindley for identification; this flower had "broad petals, a short column hooded and dilated at the apex, and a broad roundish lip gibbous at the base, and with its stalk much shorter than the column; it was, however, destitute of scent, while *Cycnoches Loddigesii* has a delicious odour of vanilla." At first Lindley assumed it to be a new species and named it *C. cucullatum,* but shortly afterwards a Cycnoches in the garden of the Horticultural Society produced from opposite sides of the same stem two racemes, one with the fragrant flowers of *C. Loddigesii* and the other with the scentless flowers of *C. cucullatum.**

Cycnoches Loddigesii was originally discovered in 1834 by Mr. John Henry Lance in the forests of Surinam, and was sent by him to

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* Bot. Reg. sub. t. 1951.

Messrs. Loddiges, in whose nursery it flowered imperfectly shortly afterwards, but more perfectly in the Horticultural Society's Gardens at Chiswick and other places two years later. It is the type or species on which the genus was founded; it has now become very rare if not entirely lost to cultivation.

C. maculatum.

Stems and leaves characteristic of the genus. Racemes of male flowers 15—18 inches long, deflexed, 5—7 or more flowered. Flowers patent, 3—4 inches in diameter; sepals and petals similar and subequal, lanceolate, acute, undulate, light yellow-green much spotted with red-purple; lip white, clawed, the claw grooved, the blade lanceolate acute, with the margins incurved and with 5—6 round fleshy, finger-like bristles spotted with purple below the middle. Column slender, curved, greenish yellow spotted with red.

Cycnoches maculatum, Lindl. in Bot. Reg. 1840, misc. No. 8. Id. *Sert. Orch.* t. 33. Rchb. in Walp. Ann. VI. p. 561. *Illus. hort.* 1873, t. 143.

Discovered by Ross in Mexico, and sent by him to Mr. Barker, of Birmingham, in whose collection it flowered in 1839. The male flowers only are known. Like the preceding species it appears at present to be lost to cultivation.

C. pentadactylon.

Racemes of male flowers pendulous, many-flowered; of female, erect, few-flowered. Flowers greenish yellow sometimes white, barred and blotched with chocolate-brown, parts of the lip white spotted with red; the column purple below the anther. The male and female flowers are shown in the accompanying woodcut. These convey a far clearer idea of the difference between the two sexes in this species than can be done by a description which in the absence of materials we are unable to give.* The five curious finger-like appendages of the lip of the male flower suggested the specific name.

Cycnoches pentadactylon, Lindl. in *Bot. Reg.* 1843, misc. No. 26; and t. 22. Id. in Paxt. Fl. Gard. III. sub. t. 75. Rchb. in Walp. Ann. VI. p. 561. Rolfe in Gard. Chron. VI. s. 3 (1889), p. 188, with figs.

Introduced by our Exeter firm in 1841 through William Lobb, who detected it in the neighbourhood of Rio de Janeiro, and shortly afterwards re-imported from that city by Messrs. Loddiges. We find no record of the appearance of female flowers till a plant in the collection of Mr. Gotto, at The Lodge, Hampstead Heath, produced a raceme of each kind in the summer of 1889; flowers from each was sent to Kew for identification and which are here represented. *Cycnoches pentadactylon* is a very handsome species, well worthy of the attention of amateurs of orchids.

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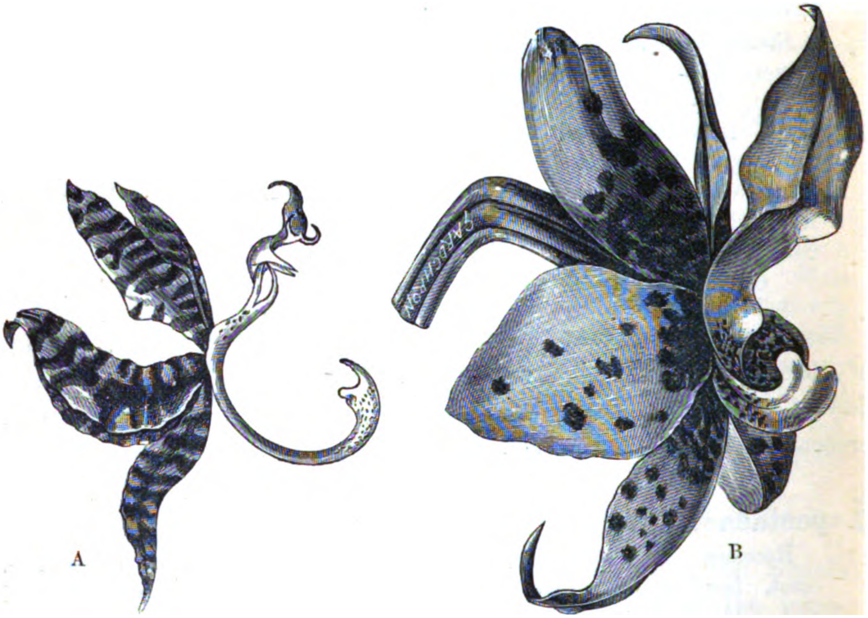
* While these sheets were being printed a fine male plant of *Cycnoches pentadactylon* was exhibited at one of the Royal Horticultural Society's meetings by Mr. W. H. Mann, of Bexley, who kindly sent us a flower; we thought it best, however, to leave the text as it is.



Cycnoches pentadactylon. A, male; B, female flower.
(From the *Gardeners' Chronicle*.)

C. versicolor.

Male flowers: Racemes pendulous, many-flowered; bracts ovate, sheathing, ½ inch long, tawny yellow. Flowers 2—2½ inches in diameter; sepals and petals reflexed and of a peculiar colour difficult to describe, a kind of deep tawny green with a velvety gloss and with close-set longitudinal brown lines; the sepals narrowly oblong; the petals broader, elliptic-oblong, acute; lip fleshy, ovate, acute, with two erect teeth in the centre between which is a deep groove, cream-white with some red spots in front of the teeth. Column green spotted with brown.

Cycnoches versicolor, Rchb. in Gard. Chron. IV. s. 3 (1888), p. 596.

A remarkable species of Brazilian origin. Reichenbach named it from materials sent to him by Sir Trevor Lawrence in 1888, to whom also our obligations are due. The colour of the male flowers is most peculiar; the female flowers we have not seen.

SUB-TRIBE MAXILLARIEÆ.

Rhizome bearing either mono-diphyllous pseudo-bulbs or produced into ascending stems with closely distichous, often equitant, leaf-sheaths with more or less developed laminæ. Leaves usually coriaceous or fleshy without prominent ribs. Scapes almost always one-flowered. The column produced into a foot.[*]

STENIA.

Lindl. in Bot. Reg. sub. t. 1991 (1837). Benth. et Hook. Gen. Plant. III. p. 553 (1883).

A small genus of which three species are now known, occurring in three widely separated localities in South America, but that described below is the only one occasionally met with in cultivation. Botanically the genus connects the STANHOPIEÆ with the MAXILLARIEÆ; the character which chiefly separates Stenia from Maxillaria is the mode of attachment of the labellum to the column, this organ being in Stenia continuous with the foot of the column, not articulated on it; the fleshy basal part of the labellum, saccate in *Stenia pallida,* indicates the affinity with Stanhopea.

The genus was founded by Dr. Lindley on *Stenia pallida,* a Demerara plant introduced by Mr. George Barker, of Birmingham, in 1836. The narrow elongated pollen masses suggested the specific name which is derived from the Greek word στενὸς, "narrow."

Stenia fimbriata.

Pseudo-bulbs none. Leaves 4—5 to each growth, linear or narrowly oblanceolate, acute, 7—10 inches long. Peduncles slender, sub-erect, about 2 inches long, one-flowered; bracts subulate, acute, much shorter than the ovary. Flowers 2 inches in diameter, light yellow with some purple spots on the basal half of the lip; sepals and petals all directed upwards, linear-oblong, acute, slightly undulate at the margin; the petals a little broader than the sepals, apiculate with denticulate margin and of thinner texture; lip broadly oblong, the basal half fleshy and turned upwards on each side towards the column; the apical half semi-transparent, spreading and with fimbriate margin. Column semi-terete with very narrow wings.

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[*] Mr. Bentham has grouped nine genera under this sub-tribe, all of them of American origin, of which the type genus Maxillaria is by far the largest and most important. Of those genera not coming within the scope of this work, Ornithidium includes a few species that occasionally find their way into private collections, notably the type species *O. coccineum* (Salisb.), and *O. Sophronitis* (Rchb.).

Stenia fimbriata, Rchb. in Gard. Chron. 1868, p. 1318. Chondrorrhyncha fimbriata, Rchb. in Saunders' *Ref. Bot. II.* t. 107 (1872).

A native of the eastern Cordillera of New Granada at a considerable elevation. It was first detected by Schlim about the year 1847 near Ocaña, and it was afterwards gathered by Blunt, Roezl and other collectors of orchids in that region. It was introduced into European gardens by M. Linden, of Brussels, in 1868, through Gustav Wallis.

Cultural Note.—This plant was first cultivated in England by the late Mr. Wilson Saunders, at Hillfield, Reigate, who placed it in a cool damp shady house, where it grew freely and produced its flowers very regularly when potted in peat and sphagnum, and carefully drained.*

SCHLIMIA.

Planchon in Lind. Catal. 1852, ex Lindl. in Paxt. Fl. Gard. III. p. 115, fig. 287. Benth. et Hook. Gen. Plant. III. p. 553.

Schlimia includes three closely allied Colombian species of which *S. trifida* is the best known. The genus is chiefly distinguished by its peculiarly-shaped flowers which approach somewhat those of a Stanhopea, and thus like Stenia it is a connecting link between Stanhopea and Maxillaria. It commemorates Louis Schlim, a relative of M. Linden and a collector of orchids for him in Colombia, and who discovered and introduced the typo species *S. jasminodora* in 1850—51.

Schlimia trifida.

Pseudo-bulbs sub-fusiform, about an inch long, monophyllous. Leaves shortly petiolate, elliptic-oblong, acute, 4—6 inches long. Scapes drooping, dull purple, bearing a one-sided (usually inverted) four-flowered raceme. Flowers 2 inches across vertically, very fragrant, white with some purple spots on the dorsal sepal which is oblong, obtuse; the lateral sepals produced into a large helmet-shaped sac; petals linear, acute, reflexed towards their apex; lip shorter than the other segments, tripartite, the hypochile sub-pandurate with an orange-yellow blotch, the epichile lanceolate. Column semi-terete with two sub-quadrate fleshy wings.

Schlimia trifida, Rchb. in Gard. Chron. VI. (1876), p. 706. Id. VII. (1877), p. 141, with figs.

The origin of this curious and interesting plant is involved in obscurity. It first appeared in 1874 in a collection of Colombian orchids supposed to have been made by the unfortunate Brückmüller and offered at Stevens' sale rooms in May of that year. It flowered for the first time in Sir Trevor Lawrence's collection and was exhibited at the Royal Horticultural Society's meeting in January, 1877.* The plant has the aspect of a small Stanhopea; the flowers are of very remarkable structure, very fragrant, and appear as if modelled out of wax, and being inverted the saccate lateral sepals have the resemblance of an ancient Greek helmet.

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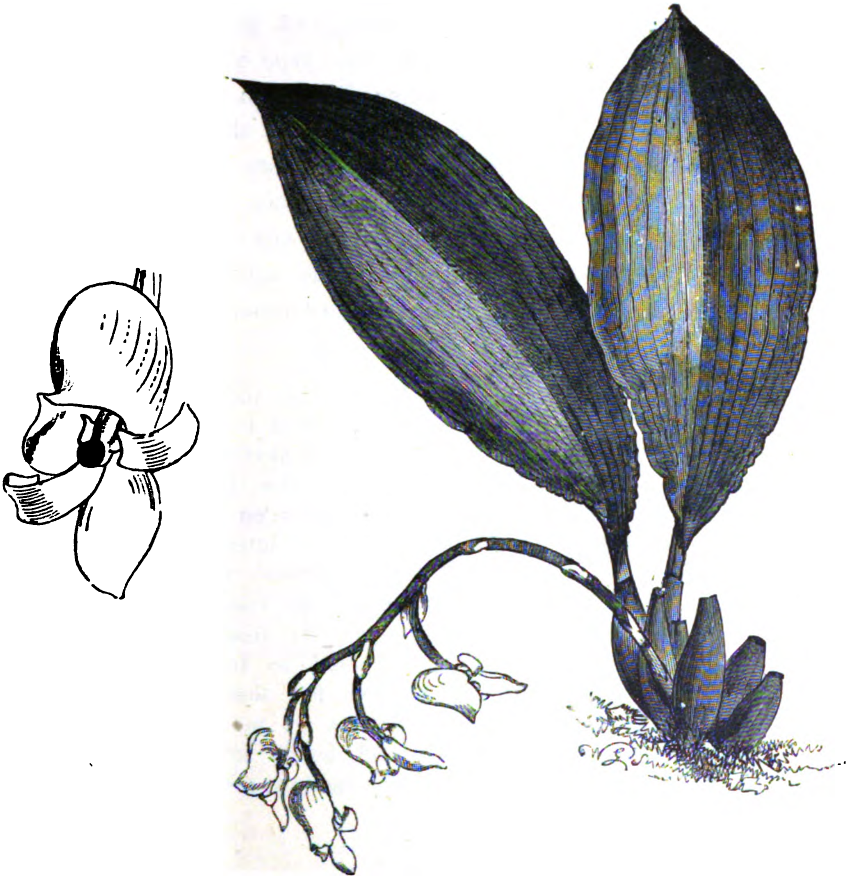
* Ref. Bot. II. sub. t. 107.



Schlimia trifida.
(From the *Gardeners' Chronicle.*)

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* A plant subsequently flowered in our houses from which the above description was taken, but we find no record of the species being in cultivation since, which is the more remarkable when the enormous quantity of Colombian orchids that have been imported is considered, a fact that would imply its being a rare plant in its native country.

SCUTICARIA.

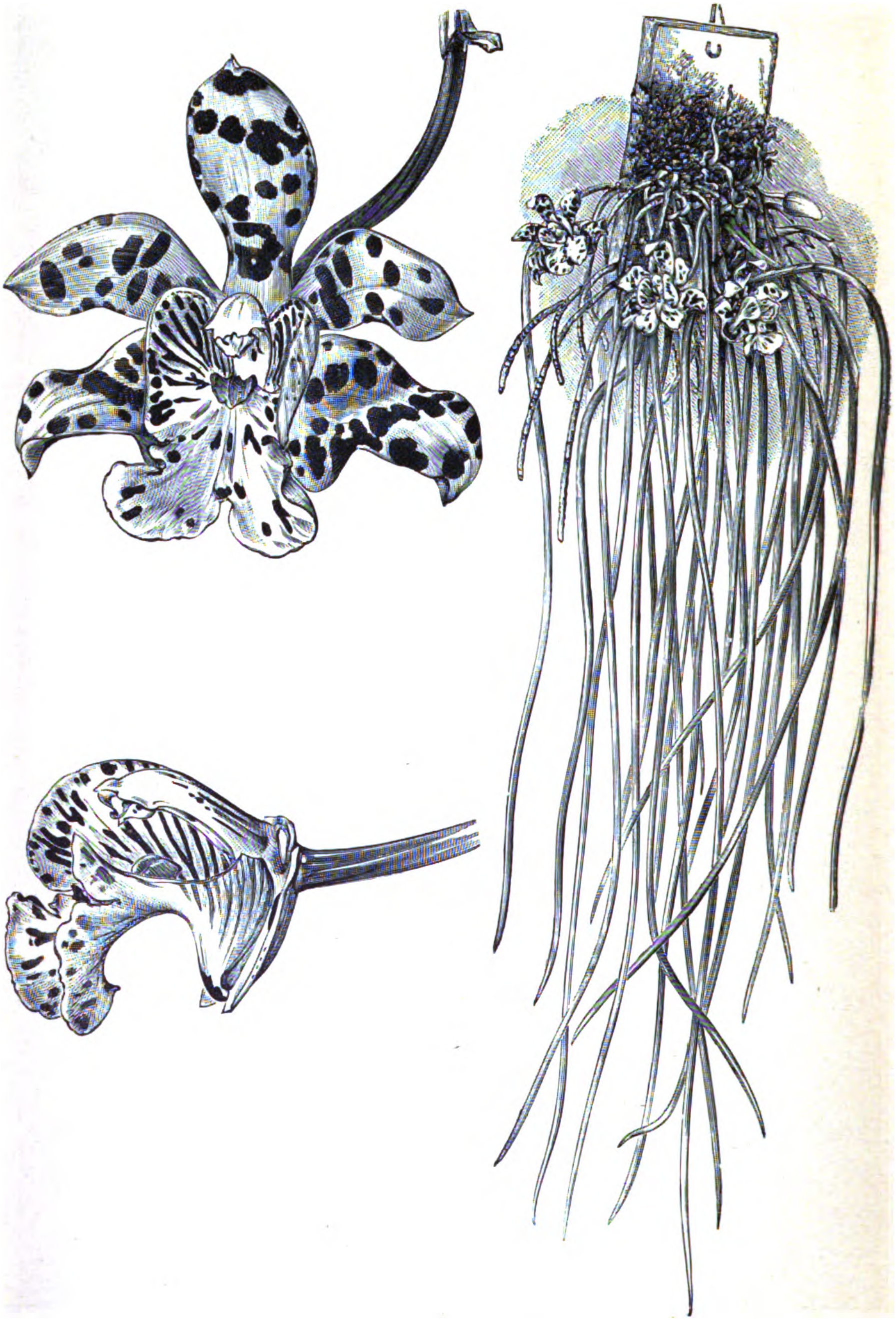
Lindl. in Bot. Reg. 1843, misc. p. 14. Benth. et Hook. Gen. Plant. III, p. 554.

Scuticaria includes two species: *S. Steelei* originally referred to Maxillaria on the assumption that the pollen masses were not stipitate (without caudicles) which is not the case, and thence removed from that genus by Dr. Lindley and made the type of a new one; and *S. Hadwenii* previously brought under Bifrenaria on account of its stipitate pollinia, but manifestly very closely allied to *S. Steelei*, although its geographical station is very remote from the home of that species. The most obvious characteristic of these species is their peculiar habit, derived chiefly from the long terete fleshy leaves furrowed on one side and continuous with the short stems; the floral characters are nearly those of Maxillaria, but the peduncles are 2—3 flowered.

Cultural Note.—The habit of the plants and their geographical stations suggest their cultural treatment, but it is to be regretted that not a scrap of information is forthcoming respecting their environment *in situ* beyond the brief statement of the brothers Schomburgk respecting the Demerara species that it grows on the trunks of trees. *Scuticaria Hadwenii* may be grown in an intermediate temperature, either in a pot or on a block. *S. Steelei* requires the highest temperature available. The plant should be attached to a block of wood, with some live sphagnum about its roots which should be renewed as it becomes decayed; it should be freely syringed during the growing season. It is a well-known fact that orchids with terete fleshy leaves, like those of the Scuticarias, are much exposed to direct sunlight in their native countries, and hence, in the glass-houses of Europe, they should be placed in the lightest position possible.

Scuticaria Hadwenii.

Stems very short, knotty, ash-brown, swollen at the base. Leaves 9—18 inches long. Peduncles stoutish, 4—5 inches long, 1—2 flowered, sheathed at the base by brownish, acute, scale-like bracts, the ovary long and terete. Flowers 2½—3 inches in diameter; sepals and petals spreading, fleshy, oblong, acute, chestnut-brown, paler towards the apex, sometimes broken up into blotches on a yellow-green ground; lip broadly obovate or sub-orbicular, concave, downy within, pale yellow blotched and spotted with light brown in the centre, the marginal area white spotted with light rose; crest an oblong plate three-toothed in front;



Scuticaria Steelei.

swollen at the base. Column semi-terete, much spotted with purple, white at the apex.

Scuticaria Hadwenii, Benth. in Journ. Linn. Soc. XVIII. p. 323 (1881). Rolfe in Gard. Chron. I. s. 3 (1887), p. 733. Bifrenaria Hadwenii, Lindl. in Paxt. Fl. Gard. I. p. 67 (1851). *Bot. Mag.* t. 4629. Van Houtte's *Fl. des Serres, VII.* t. 731. Rchb. in Walp. Ann. VI. p. 550.

Introduced from Rio de Janeiro by Mr. Isaac Hadwen, of Liverpool, in whose garden it flowered in June, 1851, and by whom it was communicated to the Royal Gardens at Kew and to other collections. It was shortly afterwards brought from southern Brazil by the late Mr. Miers, of Hammersmith, and has since been occasionally imported with other Brazilian orchids. As a horticultural plant it is less showy than *Scuticaria Steelei,* from which it is easily distinguished by its much shorter leaves and differently-shaped labellum.

S. Steelei.

Stems as thick as an ordinary writing pencil, 1—2 inches long, invested with greyish, lacerated, membraneous sheaths. Leaves quite pendulous, tapering towards the apex 1—4 feet long. Peduncles 1—3 flowered. Flowers nearly 3 inches in diameter, light yellow spotted with red-brown, the fleshy crest of the lip orange-yellow; sepals and petals oblong, sub-acute, the lateral sepals the broadest, connate at their base, and forming with the base of the lip an obtuse *mentum* or chin; lip sub-orbicular when spread out, three-lobed, the side lobes turned upwards; the front lobe spreading, with a sinus in the anterior margin; crest an oblong fleshy plate, traversed longitudinally by five raised lines. Column semi-terete, bent.

Scuticaria Steelei, Lindl. in Bot. Reg. 1843, misc. p. 14 (Steelii). Rchb. in Walp. Ann. VI. p. 551. Williams' *Orch. Alb. II.* t. 55. Maxillaria Steelii, *Bot. Mag.* t. 3573. *Bot. Reg.* t. 1986. Schomb. Reisen. III. p. 909.

The handsomest of the Scuticarias as regards its flowers and the most singular in its excessively elongated leaves. It was introduced from Demerara in 1836 by Mr. Matthew Steele, by whom it was communicated to Mr. Moss, of Otterspool, near Liverpool, in whose garden it flowered for the first time in this country in the following year. It was detected by the brothers Schomburgk during their exploration of British Guiana, 1840—44, "on the banks of the rivers Essequibo and Demerara on the trunks of trees, flowering in June and July."

MAXILLARIA.

Ruiz et Pavon, Fl. Peruv. Prod. p. 116, t. 25 (1794). Lindl. Bot. Reg. 1843, misc. p. 10. Benth. et Hook. Gen. Plant. III. p. 553.

The genus Maxillaria was founded by the Spanish botanists Ruiz and Pavon on a group of epiphytal orchids, which they discovered on the Andes of Peru during their mission to that country, 1777—88. Owing to the terse but imperfect manner in which the genus was defined by these authors it became afterwards, as Mr. Bentham remarked, "a kind of receptacle for a great variety of American VANDEÆ," until the confusion became so great that Dr. Lindley undertook a revision of the genus, the results of which he published in the *Botanical Register* of 1843. Out of the aggregation of species that had been brought under Maxillaria up to that time he formed a number of new genera as Lycaste, Paphinia, Colax, Warrea, Scuticaria, etc., retaining under Maxillaria those species that conform to the characters described below. Thus restricted, Maxillaria is still an extensive genus, including, perhaps, over a hundred species, but forming a very natural group.

The lateral *sepals* are adnate to the foot of the column, forming with it a more or less prominent *mentum* or chin. The dorsal sepal is similar, and usually at a right angle to the lateral two.*

The *petals* are similar, but smaller and parallel with the column.

The *lip* is attached to the foot of the column by a very short claw, it is turned towards the column, three-lobed, concave, and with an oblong plate between the side lobes.

The *column* is wingless, often slightly curved, semi-terete, concave below the stigma.

The *pollinia* are four in two pairs, compressed, and almost sessile on a crescent-shaped gland.

It will be observed that some of these floral characters, especially the attachment of the lateral sepals and lip to the foot of the column, are found in allied genera, but from these the true Maxillarias can always be distinguished by their vegetative organs.

The *pseudo-bulbs* are more or less flattened, with one or more sheathing, acuminate brown spathes on each of the ancipitous sides.

The *leaves* are variable in size and shape but always persistent, leathery in texture and usually dark green.

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* This arrangement of the sepals, especially when the lateral two take a horizontal position, which they almost always do, gives the flowers a one-sided aspect.

The *scapes* are always one-flowered, and clothed with 4—6 or more sheathing bracts that are at first green and foliaceous, but become brown and scarious before the flower fades.

Two sectional divisions of the Maxillarias have been made in reference to the habit of the plants.

1. Acaules, in which the rhizome is short and inconspicuous, and in which therefore the pseudo-bulbs are clustered as in *grandiflora*, *Parkeri*, *picta*, *Sanderiana*, *venusta*, etc.

2. Caulescentes, in which the rhizome is produced beyond the pseudo-bulbs, and the plant assumes a scandent habit as *tenuifolia*, *variabilis*, etc.

The generic name is derived from *maxillæ*, "the jaws of an insect," from the fancied resemblance of the column and lip of some of the species to those organs.

The geographical limits of the Maxillarias cannot be very clearly stated owing to the immense area in tropical America that still remains botanically unexplored. In general terms they may be said to be dispersed over tropical America from southern Brazil to Mexico and the West Indies, being most numerous probably on the Cordilleras of the Andes where they ascend to 5,000 feet or more.

Cultural Note.—In a large genus like Maxillaria, in which much diversity of station occurs among the species, some living in the hot valleys of Brazil and Guiana, others in the West India islands, and others again ascending the Andes to several thousand feet, the geographical position of a species is the best indication of the temperature in which it should be cultivated in the glass-houses of Europe. In other respects the general cultural routine may be thus formulated:—The plants should be potted when new roots begin to appear, in a compost of two-thirds fibrous peat and one-third sphagnum moss placed on a drainage of clean broken crocks that fill the pots up to about two-thirds of their depth. After potting, water should be carefully applied till the plants root freely, when a larger quantity should be given regularly till the new growths are mature. As the Maxillarias are usually found growing more or less in shade, they should not be exposed to direct sunlight during the hottest season; they should receive at all times as much ventilation as external circumstances admit. For *Maxillaria Sanderiana* a teak basket such as that represented in the figure at page 160, and which can be suspended near the glass, is the best.

SYNOPSIS OF SPECIES AND VARIETIES.

Maxillaria acutipetala.

Pseudo-bulbs ovoid, 1½—2 inches long, prominently ribbed and furrowed, diphyllous. Leaves broadly linear, acute, 7—10 or more inches long. Scapes 5 - 6 inches long, sheathed by three oblong, obtuse bracts. Flowers 2½ inches across the lateral sepals; sepals and petals light orange-yellow, paler and spotted with dark sanguineous purple behind; the sepals linear-oblong, obtuse; the petals similar but narrower, shorter and very acute; lip shorter than the other segments, three-lobed, the side lobes narrow, erect, pale yellow streaked longitudinally with red; the front lobe oblong, obtuse, crisped and reflexed, cream-white spotted with red. Column semi-terete, yellow streaked with red.

Maxillaria acutipetala, Hook. in *Bot. Mag.* t. 3966 (1843). Lindl. in Bot. Reg. 1843, misc. No. 36.

Introduced to the Royal Gardens at Kew more than fifty years ago from Central America by Mr. Barclay, a gardener attached to Her Majesty's surveying ship, *Sulphur.* It much resembles *Maxillaria picta* on superficial view, but the flowers are larger, of brighter colours, and have a differently-shaped labellum; it flowers in the winter months. Mr. F. W. Moore, of Glasnevin, kindly sent us materials for description.

M. crocea.

Pseudo-bulbs oblong, compressed, about an inch long, monophyllous. Leaves narrowly ligulate, sub-acute, 5—7 inches long. Scapes 4—5 inches long; bracts subulate, ½ inch long. Flower orange-yellow; sepals linear, acute, an inch long; petals similar but shorter and bent forwards; lip short and fleshy, reflexed, crisped at the margin, brownish red. Column semi-terete, coloured like the lip.

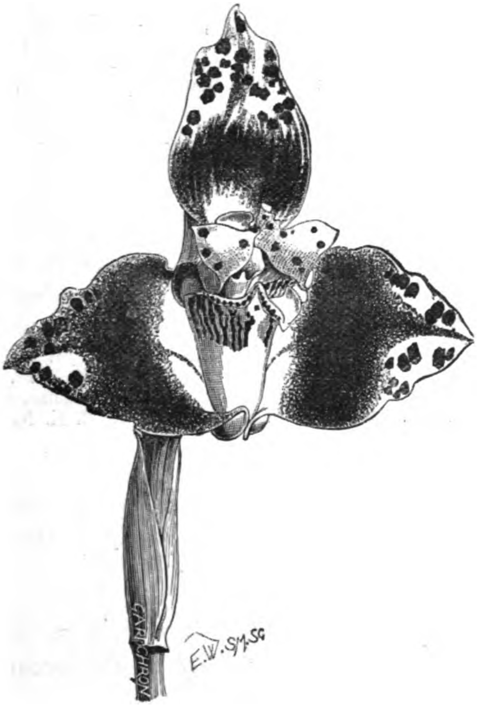
Maxillaria crocea, Lindl. in *Bot. Reg.* t. 1799 (1836). Rchb. in Walp. Ann. VI. p. 522.

Introduced from Rio de Janeiro in 1833 by Captain Sutton, of the Royal Packet Service, and presented by him to Sir Charles Lemon, Bart., in whose garden at Carclew it flowered in the following year. It is very near *Maxillaria punctata,* but much more attractive.

M. fucata.

Pseudo-bulbs clustered, narrowly ovate-oblong, 1½—2½ inches long, compressed with acute edges. Leaves lanceolate, 12—15 inches long, narrowed below into a conduplicate petiole one-third the length of the blade. Scapes about 6 inches long; bracts broadly ovate, acute, prominently keeled. Flowers 2½ inches in diameter, of rather coriaceous texture; sepals white at the base, brick-red in the middle, tawny yellow spotted with red-brown at the apex; the dorsal sepal ovate-oblong, subapiculate, strongly keeled behind, the lateral two much larger, broadly ovate, obtuse; petals oblong, apiculate, reflexed at the apex, white at the base with some brick-red lines, the apical area yellow; lip suborbicular, obscurely lobed, thickened at the apex, red-brown at the base, sulphur-yellow at the apex; plate of disk grooved bright yellow. Column triquetral, bent, whitish.

Maxillaria fucata, Rchb. in Gard. Chron. XXVI. (1886), p. 616. Gard. Chron. IV. s. 3 (1888), p. 577, with fig. (*errore* fuscata).



Maxillaria fucata.
(From the *Gardeners' Chronicle.*)

sub-var.—Hübschii.

Flowers identical in size and structure; sepals and petals French-white with an irregular purple apical spot; lip light yellow in front, reddish brown at the lateral margins. Column white, streaked with red-brown below the stigma.

M. fucata Hübschii, supra. M. Hübschii, Rchb. in Gard. Chron. III. s. 3 (1888), p. 136.

A most remarkable Maxillaria as regards the colour of its flowers, in cultivation at Burford Lodge, whence were derived the materials for description. The variety, a very attractive one, is an albino form and was introduced by Messrs. Sander and Co. through the collector whose name it bears. No locality has been divulged, but as it is said to have been found while the collector was in search of *Maxillaria Sanderiana,* both species and variety are probably of Ecuadorean origin.

M. grandiflora.

Pseudo-bulbs broadly oval-oblong, much compressed, 1½—3 inches long, monophyllous. Leaves ligulate, acute, 12—15 inches long, 1½—2 inches broad, cuneate-conduplicate at base, strongly keeled beneath. Scapes stoutish, 4—5 inches long; bracts boat-shaped, acute, keeled. Flowers among the largest in the genus; sepals and petals ovate-oblong, subacute, milk-white; the sepals 2 inches long, the dorsal one keeled behind, the petals much smaller and reflexed at the apex; lip broadly oval, obscurely three-lobed, the side lobes incurved, vinous purple, striated; the intermediate lobe reflexed, thickened and crisped at the margin, light buff-yellow; plate of disk grooved, thickened and free at the apex. Column thick, terete, and white above; yellow spotted with red in front.

Maxillaria grandiflora, Lindl. Gen. et Sp. Orch. p. 147 (1832). Rchb. in Walp. Ann. VI. p. 516. *Illus. hort. XXII.* t. 14 (1870). *Fl. Mag.* N.S. pl. 322. M. eburnea, Lindl. *Sert. Orch.* t. 40, No. 2. M. Lehmanni, Rchb. in Gard. Chron. XXV. (1886), p. 648. Dendrobium grandiflorum, H. B. K. Nov. Gen. I. t. 88.

var.—Amesiana.

Flowers larger than the usual forms; the petals streaked longitudinally on the basal half with rose-pink; the margin of the side lobes of the lip streaked with broad and short red lines.

M. grandiflora Amesiana, Hort.

The botanical history of this fine Maxillaria is most obscure, and even its precise habitat is known only to the orchid collectors who sent it to Europe.

It is unquestionably the *Dendrobium grandiflorum* of Humboldt and Kunth as figured by them in their *Nova Genera et Species.* Its habitat is there stated to be—

> In radicibus Andium Paraguayensium prope rupem El Pupito, villam La Erre et planitiem montanam Sacondonvensium alt 1060 hexap. (6,000—7,000 feet).

As no such mountains as the Andes of Paraguay are known in modern geography, and the other places mentioned are not found on any map to which we have access, the habitat given by Humboldt is virtually valueless although quoted by Lindley in his *Genera and Species of Orchidaceous Plants,* where the plant was first referred to Maxillaria.

It was next dealt with by Reichenbach in Walper's *Annales Botanices* in 1863; he gives no description of the plant but only the following brief quotation, apparently from a Lindenian source. "An epiphyte with oval flattened pseudo-bulbs, petals white as snow with a powdery yellow lip. Forests of Jaji in the province of Merida 5,000—6,000 feet elevation, Ocaña at 6,000 feet." But this evidently refers to *Maxillaria venusta* which comes from that region and which has occasionally been confused with *M. grandiflora.* The next notice of it occurs in *L'Illustration horticole* of 1870, at that time edited by M. André, who described the plant from living specimens which had been sent by Wallis to M. Linden's horticultural establishment in 1867 from Peru (probably Ecuador is meant), its station being at an altitude of 5,000—6,500 feet. If we assume the word *Paraguayensium* of Humboldt and Kunth to be a clerical error for *Peruvianorum,* the habitat given by them can to a great extent be reconciled with that given by André. The *M. eburnea* of Lindley was gathered near Mount Meracævi, about 30 miles N.N.E. from Cimeralda, but this locality is as obscure as that given by Humboldt.

M. Houtteana.

Pseudo-bulbs narrowly oblong, compressed, 1½—2 inches long, monophyllous. Leaves linear-ligulate, acute, 4—6 inches long. Scapes short; sepals and petals ligulate, acute, cinnamon-brown with a narrow yellow margin, brownish green behind, the petals a little narrower and shorter than the sepals; lip oblong, acute, not lobed, gently reflexed towards the apex, gamboge-yellow spotted with red-purple. Column semi-terete, red spotted with yellow in front.

Maxillaria Houtteana, Rchb. in Hamburg Gartenzeit, XIV. p. 212 (1858). Regel's Gartenfl. 1858, p. 286.

Our knowledge of this species is derived from a plant in the Royal Gardens at Kew, where the above description was taken It was originally introduced from Guatemala by the late Louis Van Houtte, in whose nursery at Ghent it flowered in 1849. It is a dwarf species remarkably distinct in the colour of its flowers.

M. lepidota.

Pseudo-bulbs narrowly ovoid, 1—1½ inch long, monophyllous. Leaves linear-lanceolate, 9—12 inches long, conduplicate at the base. Scapes much shorter than the leaves. Sepals linear from a lanceolate base, tail-like, 2½ inches long, the broader basal portion yellow, the tails brown; petals similar but shorter, wholly yellow; lip oblong, acute, the lateral margins incurved; the apical half concave, reflexed, yellow spotted with blackish purple; plate of disk grooved, pubescent. Column yellow.

Maxillaria lepidota, Lindl. Ann. Nat. Hist. XV. (1845), p. 38, ex Rchb. in Walp. Ann. VI. p. 525. Rchb. in Gard. Chron. IX. (1878), p. 168.

Originally discovered by Hartweg in southern Colombia, near Popayan, in 1841—42, and gathered by Spruce on the Andes of Ecuador in 1858, but not introduced into British gardens till 1877, when it was received by Messrs. Low and Co., of Clapton, and Mr. Bull, of Chelsea, from their respective correspondents. This and the next species to be described are remarkable among the cultivated Maxillarias for their long tail-like sepals, a character expressed by the specific names.

M. longisepala.*

"Pseudo-bulbs tufted, ovate or ovate-oblong, sub-compressed, 1—1¼ inch long. Leaves narrowly ligulate, acute, 6—9 inches long. Scapes 6 inches long; bracts lanceolate, acute, reddish brown. Sepals nearly 4 inches long, very narrow, acuminate, pale purple-brown faintly striated with a darker shade; petals similar but a little shorter; lip ovate-oblong, obtuse or sub-apiculate, the margin a little reflexed, light yellowish green with radiating lines of dark reddish brown on the margin. Column pale green."—R. A. Rolfe in Gard. Chron. VIII. s. 3 (1890), p. 94.

Maxillaria longisepala, Rolfe in Gard. Chron. loc. cit. *Lindenia, VI.* t. 248.

"A new and elegant species sent from Venezuela by Bungeroth to M. Linden, L'Horticulture Internationale of Brussels, in 1890."

M. luteo-alba.

Pseudo-bulbs broadly ovate-oblong, much compressed, about 2 inches long, monophyllous. Leaves broadly ligulate, 15—20 inches long, cuneate below and passing into a short folded petiole. Peduncles about 6 inches high; bracts slightly inflated. Flowers large and fragrant; sepals linear-oblong, acute, 3 inches long, white at the base, the remainder tawny yellow, reddish purple behind; petals similar but narrower, shorter and more acute; lip three-lobed, the side lobes oblong, erect, whitish obliquely streaked with dark purple on the inner side; the intermediate lobe oblong, emarginate, reflexed, white; plate of disk yellow. Column short, terete and white above, purplish below the stigma.

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* Not seen by us.

Maxillaria luteo-alba, Lindl. Orch. Lind. p. 20, No. 106 (1846). Rchb. in Bonpl. II. p. 18. Id. in Walp. Ann. VI. p. 516. *Fl. Mag.* pl. 559 (luteo-grandiflora). Williams' *Orch. Alb. III.* t. 106.

var.—Turneri.

Pseudo-bulbs smaller. Leaves shorter, narrower, more leathery and of a darker green. Flowers a little smaller in all their parts; the front lobe of the lip less distinctly emarginate.

M. luteo-alba Turneri, supra. M. Turneri, Hort.

A handsome species discovered by Linden in 1842 on the Cordillera of Venezuela, near Merida, at 5,000—7,000 feet elevation, and subsequently gathered in the same region by Schlim, Wagener and other collectors. We find no record of its first introduction into British gardens.

M. marginata.

Pseudo-bulbs ovoid or ovate-oblong, 1½—2 inches long, mono-diphyllous. Leaves linear-lanceolate, acute, 5—8 inches long. Peduncles 3—4 inches long, the ovary mottled with dull green and crimson. Flowers about 1½ inch across vertically; sepals bent forward, linear-oblong, acute, light orange-yellow with a narrow dark red margin and a median red line behind; petals similar but much smaller; lip three-lobed, the side lobes oblong, erect, streaked obliquely with red-purple; the front lobe oblong, acute, reflexed, light yellow; plate of disk fleshy, thickened in front.

Maxillaria marginata, Fenzl. in Van Houtte's Fl. des Serres, X. p. 112 (1854). Rchb. in Walp. Ann. VI. p. 520. Rolfe in Gard. Chron. V. s. 3 (1889), p. 770. Cymbidium marginatum, Lindl. in *Bot. Reg. XVIII.* (1832), t. 1530.

Introduced from Rio de Janeiro to the garden of the Horticultural Society of London at Chiswick, where it flowered in November, 1830; a few years later it was gathered by Gardner at Rio Compaido in southern Brazil. Not being a very showy plant it seems to have been generally neglected by horticulturists. We received flowers from Burford Lodge and Glasnevin.

M. nigrescens.

Pseudo-bulbs ovoid, compressed, 1—2 inches long, monophyllous. Leaves linear-lanceolate, 10—12 inches long, sub-acute, conduplicate at base, very coriaceous. Peduncles drooping, 2—3 inches long. Sepals broadly linear, 2 inches long, port-wine colour; petals similar but shorter and darker in colour; lip oblong with incurved margins and reflexed triangular apex, blackish purple, paler at the apex. Column arching, terete above, concave below the stigma, vinous purple.

Maxillaria nigrescens, Lindl. Orch. Lind. p. 20, No. 105 (1846). Rchb. in Walp. Ann. VI. p. 518.

One of the Lindenian discoveries on the Cordillera of Merida in 1842; it was collected some years later near Hato Arribo by Wagener, who introduced it to the Botanic Garden at Hamburgh. The dark and lurid colour of its flowers secures for it a place in many collections.

M. Parkeri.

Pseudo-bulbs ovoid, much compressed, 1½—2 inches long, monophyllous. Leaves linear-lanceolate, acute, 10—15 inches long conduplicate at the base. Peduncles about 3 inches long, sheathed by alternate, imbricating, slightly inflated bracts that are striated with dull crimson. Flowers 3½ inches across the lateral sepals; sepals oblong, light tawny yellow, the dorsal one apiculate and with a median sunk line; petals lanceolate, acute, reflexed at the apex, cream-white with 7—9 purple lines on the basal half; lip three-lobed, the side lobes oblong, incurved, streaked longitudinally with purple; the terminal lobe narrowly oblong, reflexed, tawny yellow passing into white at the denticulate margin; plate of disk downy, thickened in front. Column semi-terete, dark purple; anther white.

Maxillaria Parkeri, Hook. *Bot. Mag.* t. 2729. Lindl. Gen. et Sp. Orch. p. 146.

An attractive species originally discovered in Demerara by Mr. C. S. Parker, who sent it to the Liverpool Botanic Garden, where it flowered in 1827. It has since been occasionally imported.

M. picta.

Pseudo-bulbs ovoid, 2—3 inches long, compressed, mono-diphyllous. Leaves narrowly ligulate, acute, 9—15 inches long. Peduncles half as long as the leaves. Sepals and petals linear-oblong, acute, more or less incurved; the sepals light tawny yellow on the inside, whitish spotted with purple behind; the petals coloured like the sepals with the addition of a red streak at the base; lip oblong, white marked with purple on the side lobes which are narrow and erect, the front lobe reflexed, acute; plate of disk oblong, downy. Column terete, blackish purple.

Maxillaria picta, Hook. in *Bot. Mag.* t. 3154 (1832). Lindl. Gen. et Sp. Orch. p. 146. *Bot. Reg.* t. 1802.

Originally sent to Mrs. Arnold Harrison, of Liverpool, in 1831 by her relative Mr. William Harrison, who had gathered it on the Organ Mountains, near Rio Janeiro, and shortly afterwards imported by Messrs. Loddiges, of Hackney. Like many of the older introductions from Brazil which were once generally cultivated, it has of late years receded in public favour.

M. porphyrostele.*

"Pseudo-bulbs orbicular-ovoid, compressed, diphyllous. Leaves linear, 5—7 inches long, narrowed at the base. Scapes much shorter than the leaves. Flowers about 1¼ inch broad, light golden yellow with a purple median stripe towards the base of the petals; sepals incurved, the dorsal one linear-oblong, the lateral two more lanceolate and much broader at the base; petals shorter and narrower than the sepals, ascending and incurved; lip three-lobed, the lateral lobes ear-shaped, erect with incurved margins; the mid-lobe orbicular-oblong with rounded tip, nearly flat with a tubercular callus at the base. Column slender, purple."—*Botanical Magazine.*

Maxillaria porphyrostele, Rchb. in Gard. Chron. 1873, p. 978. *Bot. Mag.* t. 6477.

Introduced from the Brazilian province of Rio Grande do Sul by Mr. William Bull, of Chelsea, in whose nursery it flowered in 1873. It is nearly allied to the preceding species, *Maxillaria picta,* differing chiefly in the pseudo-bulbs, bracts and colour of the flowers, which are as in *M. picta* very copiously produced. The specific name refers to the purple column.

M. præstans.

Pseudo-bulbs broadly ovoid, compressed, 1½—2 inches long, monophyllous. Leaves linear-oblong, 7—9 inches long, emarginate, narrowed and conduplicate at the base. Peduncles slightly ancipitous, the cauline sheaths brown, the larger floral bract inflated and green. Sepals and petals narrowly oblong, acute, tawny yellow dotted with red-brown at the base, the sepals 2 inches long, the dorsal one strongly keeled at the back; the petals shorter and nearly parallel with the dorsal sepal; lip oblong, three-lobed, the side lobes small, rounded, erect, densely spotted with vinous red; the intermediate lobe ovate-oblong, reflexed, brownish yellow with numerous reddish warts; plate of disk grooved, whitish. Column semi-terete, yellow dotted with red.

Maxillaria præstans, Rchb. in Gard. Chron. XXIII. (1885), p. 566. M. Kimballiana, Hort.

A handsome species first sent to Messrs. Low and Co., of Clapton, in 1883—84 from Guatemala by Mr. F. C. Lehmann, now German Consul in the States of Colombia. Its precise habitat has not been divulged.

M. punctata.

Pseudo-bulbs ovoid, about an inch long, monophyllous. Leaves linear-lanceolate, acute, 7—10 inches long, narrowed and conduplicate at the base. Scapes pale green, 3—4 inches long. Flowers about 2½ inches across the lateral sepals, light yellow, paler at the back with here and there a sanguineous spot; sepals linear, acute; petals similar but narrower and more acute; lip obscurely lobed, as long as the column, reflexed at the apex, yellow with red longitudinal lines. Column slender, semi-terete, pale yellow, red at the apex.

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* Not seen by us.

Maxillaria punctata, Lodd. Bot. Cab. XX. t. 1914 (1833). Gard. Chron. II. s. 3 (1887), p. 787.

A small-flowered but very floriferous species imported from Brazil some time prior to 1833, in which year it was figured in Loddiges' *Botanical Cabinet*. It is in cultivation at Kew and Glasnevin.

M. rufescens.

Pseudo-bulbs ovate, sub-tetragonous, 2 inches long, monophyllous. Leaves ligulate-oblong, acute, 6—8 inches long. Peduncles ascending, 1—2 inches long, purplish with a dark red-brown sheathing bract at the base and a similar larger one at the base of the ovary. Sepals ligulate, sub-acute, reddish brown; petals similar but narrower and shorter, light yellow; lip three-lobed, yellow spotted with red, the side lobes roundish, erect; the intermediate lobe oblong, gently reflexed, the thickened plate between the side lobes buff-yellow. Column triquetral, reddish brown.

Maxillaria rufescens, Lindl. in *Bot. Reg. XXI.* sub. t. 1802; and *XXII.* t. 1848 (1836). Saunders' *Ref. Bot. II.* pl. 79 and 133. M. fucata, Hort. (not of Rchb.).

Originally imported from Trinidad by Messrs. Low and Co. upwards of sixty years ago; it also occurs in Cuba where it was collected by Wright, and in Caracas where it was found by Wagener.* It flowered for the first time in this country at Chatsworth in 1834. The species appears to be variable in the size and colour of its flowers.

M. Sanderiana.

Pseudo-bulbs ovoid, compressed with acute edges, 2 inches long, monophyllous. Leaves petiolate, narrowly oblong, acute, 7—12 inches long. Scapes decumbent, sometimes ascending, 5—6 inches long; bracts ovate-lanceolate, acuminate, 1½ inch long. Flowers 5—6 inches across the lateral sepals; sepals ovate-oblong, apiculate, the lateral two broader at the base than the dorsal one which is keeled behind, French-white, the dorsal one spotted with sanguineous red at the base only, the lateral two heavily blotched and spotted with sanguineous red to beyond the middle; petals erect, similar to the lateral sepals and coloured like them but smaller; lip fleshy, ovate, three-lobed, ivory-white with some deep sanguineous stains on the side lobes

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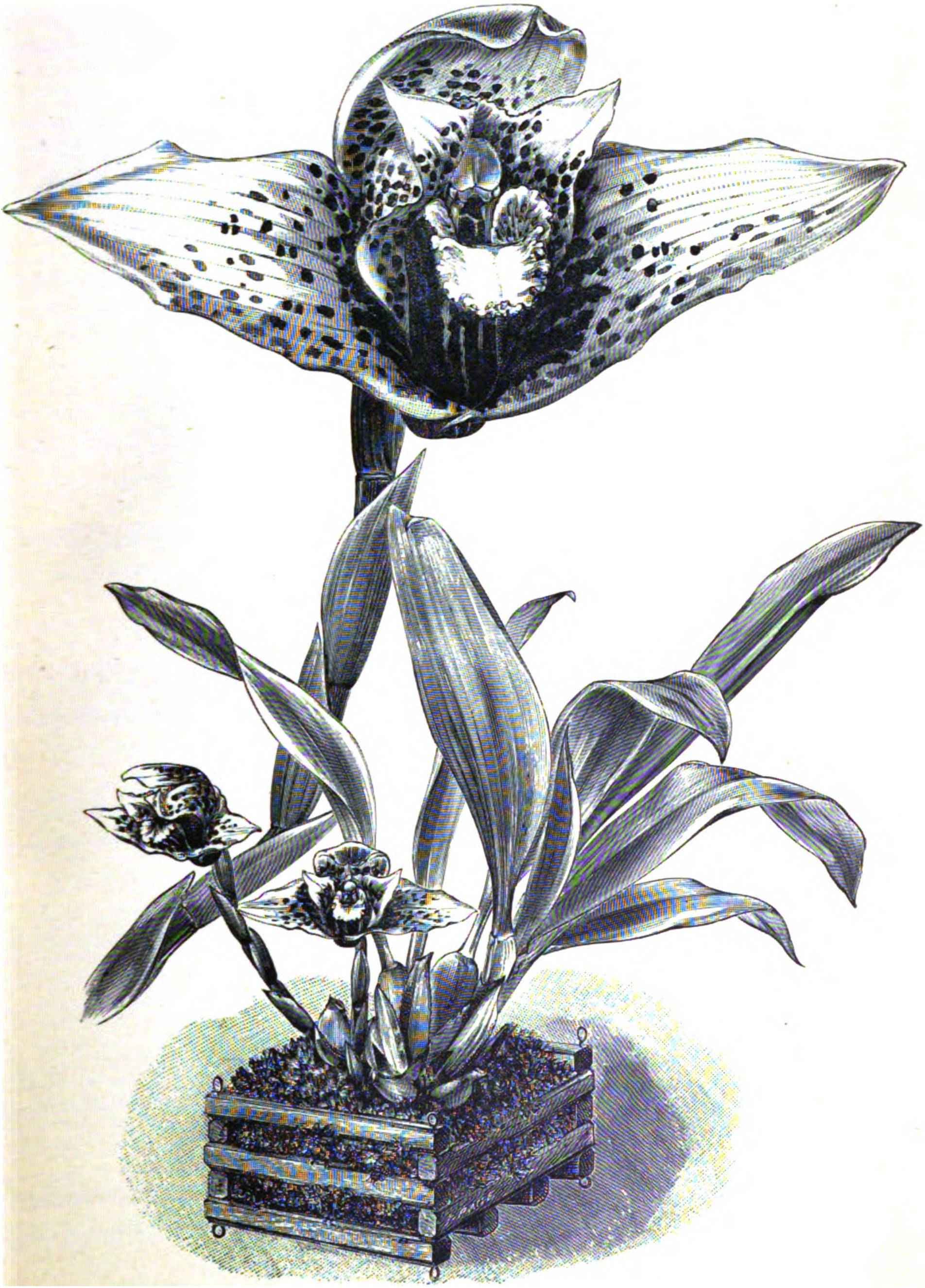
* *Fide* Reichenbach in Saunders' *Refugium Botanicum, II.* sub. pl. 133.



Maxillaria Sanderiana.

which are rounded and incurved; margin of intermediate lobe revolute and crisped; plate of disk tongue-shaped. Column trigonal, deep sanguineous red above, white spotted with red-purple below the stigma.

Maxillaria Sanderiana, Rchb. in Sander's *Reichenbachia*, *I.* t. 25 (no date).

Unquestionably the finest of all known Maxillarias. It was discovered by Edward Klaboch on the Andes of Ecuador at an altitude of 4,000 feet and introduced through him by Messrs. Sander and Co. in 1883 or 1884. It flowered for the first time in this country in the collection of Baron Schroeder, at The Dell, and was exhibited by him at the Orchid Conference at South Kensington in May, 1885.

M. setigera.

Pseudo-bulbs sub-orbicular or roundish ovate, compressed, 1—1½ inch long, monophyllous. Leaves shortly petiolate, elliptic-oblong, sub-acute, 6—10 inches long. Peduncles 3—4 inches long, sheathed by alternate and distichous, slightly inflated bracts that are greenish spotted with red. Flowers fragrant; sepals linear, apiculate, 2—2½ inches long, the basal part milk-white, the remainder light yellow; petals similar but smaller and bent forwards; lip three-lobed, the side lobes oblong, involute, white streaked with purple on the inner side; the front lobe oblong with denticulate margin, reflexed, white with a bright yellow oblong, hairy disk. Column triquetral, bent, white above, purple below the stigma.

Maxillaria setigera, Lindl. in Bot. Reg. 1845, misc. No. 38. Rchb. in Walp. Ann. VI. p. 517. M. leptosepala, Hook. in *Bot. Mag.* t. 4435 (1849). M. callichroma, Rchb. in Walp. Ann. VI. p. 518.

Introduced from Caracas by Mr. George Barker, of Birmingham, in whose collection it flowered in 1844. Two years later it was sent by Purdie from northern Colombia to the Royal Gardens at Kew where it flowered in 1849, on which occasion it was figured and described in the *Botanical Magazine* under the name of *Maxillaria leptosepala,* the name by which it is still best known in gardens, Sir William Hooker having evidently overlooked Dr. Lindley's original description in the *Botanical Register* published four years previously. In its long attenuated sepals and petals it approaches *M. lepidota* and *M. longisepala,* but in every other character it is quite distinct. The specific name *setigera,* "bristle bearing," refers to the bristle-like points of the sepals and petals.

M. tenuifolia.

Rhizome ascending, sheathed by pale brown imbricating scales, Pseudo-bulbs produced from the rhizome at intervals of about an inch, ovoid, compressed, smooth, about an inch long, monophyllous. Leaves linear, acuminate, 12—15 inches long, with a sunk median line on the face, dark green. Peduncles about 2 inches long including the obscurely six-furrowed ovary. Flowers 1½—2 inches across the lateral sepals; sepals ovate-lanceolate with revolute margins, dark red speckled with yellow; petals similar but shorter, erect and parallel with the column; lip oblong, obtuse, reflexed at the apex, concave and deep sanguineous red to beyond the middle, the apical area yellow with leopard-like red-purple spots; plate of disk oblong, pubescent. Column clavate, pale yellow above, spotted with red in front.

Maxillaria tenuifolia, Lindl. in *Bot. Reg.* 1837, sub. t. 1986; and 1839, t. 8. Rchb. in Walp. Ann. VI. p. 832. Rolfe in Gard. Chron. I. s. 3 (1887), p. 702.

sub-var.—*Burford Lodge*, flowers yellow spotted with red, the spots on the petals and lip larger and deeper than those on the sepals.

An attractive species with sedge-like foliage and richly-coloured flowers that was originally discovered by Hartweg in 1837 in the vicinity of Vera Cruz and sent by him to the Horticultural Society of London, in whose garden at Chiswick it flowered for the first time in 1839. It is the most generally cultivated of the scandent Maxillarias.

M. variabilis.

Rhizome ascending, covered with brown sheathing scales. Pseudo-bulbs about the size of a filbert, monophyllous. Leaves linear, variable in length, 2—4 or more inches long. Peduncles (including ovary) about 1½ inch long. Flowers an inch across the lateral sepals, variable in colour, the form recognised as the type deep sanguineous purple; sepals oblong, apiculate; petals similar, reflexed at the apex; lip oblong, obtuse, obscurely lobed, the side margins incurved to beyond the middle. Column triquetral.

Maxillaria variabilis, Batem. in Bot. Reg. sub. t. 1986 (1837). Rchb. in Walp. Ann. VI. p. 536. M. Henchmanni, Hook. in *Bot. Mag.* t. 3614. M. atropurpurea, Hort.

sub-var.—*lutea*, flowers buff-yellow, the lip and column blotched with deep purple.

A native of Mexico that was in cultivation in several European gardens in 1837 and perhaps earlier: it appears to have been first imported by Messrs. Low and Co. through Henchmann. It is one of the scandent Maxillarias cultivated in the Royal Gardens at Kew, whence we derived materials for description.

M. venusta.

Pseudo-bulbs oval-oblong, much compressed, 2—3 inches long, monophyllous. Leaves oblong-lanceolate, acute, 12—15 inches long, narrowed below into a short foot-stalk. Scapes nodding, 6—12 inches long; bracts lanceolate, acute, sheathing, 1½ inch long. Flowers 5—6 inches across the lateral sepals; sepals and petals lanceolate, acuminate, white, the former spreading, the latter much shorter and nearly parallel with the column; lip much shorter and more fleshy than the other segments, the upper surface buff-yellow, the lower one cream-white with a few red spots, three-lobed; the side lobes roundish oblong; the intermediate lobe ovate, obtuse, reflexed, downy; plate of disk oblong, nearly flat. Column clavate, triquetral, whitish.

Maxillaria venusta, Lindl. ex Rchb. in Bonpl. 1854, p. 277. Walp. Ann. VI. p. 514. Linden's *Pesc.* t. 38. *Bot. Mag.* t. 5296. M. Anatomorum, Rchb. Xen. Orch. I. p. 188, t. 67. M. Kalbreyeri, Rchb. in Gard. Chron. XXIII. (1885), p. 239.

Originally discovered by Linden in 1842 on the Cordillera of Venezuela in the province of Merida, but not introduced till 1851, when it was re-discovered by Schlim on the eastern Cordillera of New Granada, near Ocaña, and sent by him to M. Linden's horticultural establishment at Brussels, where it flowered for the first time in Europe in 1854. *Maxillaria venusta* is well known as one of the most beautiful of the genus, easily recognised by its long, acuminate, milk-white sepals and petals.

SUB-TRIBE ONCIDIEÆ.

Rhizome very short, usually terminating in mono-diphyllous pseudo-bulbs with a few distichous leaves or leaf-sheaths under them in the axils of which the scapes or peduncles arise, but in a few genera the pseudo-bulbs are wanting. Flowers often showy; the column not produced into a foot; the pollinia with a distinct stipes (caudicle).[*]

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[*] The sub-tribe ONCIDIEÆ is one of the most extensive and, in a horticultural sense, one of the most important in the Order. Mr. Bentham has included in it thirty-six genera, all of them American, which are distributed into five series, chiefly in reference to the characters of the labellum and its attachment to the column. Of these series the fourth comprises a large number of species familiar to orchid growers as Odontoglots, Oncids, Miltonias and Brassias. On account of the horticultural importance of many of the included genera, more space is devoted in this work to this sub-tribe than to any other.

COMPARETTIA.

Pöppig et Endl. Nov. Gen. et Sp. I. p. 42, t. 73 (1835). Benth. et Hook. Gen. Plant. III. p. 558.

A small genus including four or five species, natives of tropical America. The chief character that distinguishes Comparettia from other genera is the slender spur which is a remarkable structure; it is not a simple organ but consists of three spurs, two of which are produced from the labellum and one from the united base of the lateral sepals within which the two spurs of the labellum are hidden and not discoverable till the sepaline spur is cut open. In all the species it is more or less divergent from the ovary.

The Comparettias are dwarf plants with short stems, leathery leaves few in number, and lax racemes of handsomely-coloured flowers. The genus commemorates Andreas Comparetti, Professor of Botany at Padua and one of the most eminent vegetable physiologists of his time.

Cultural Note.—A latticed stage placed not more than 18—24 inches from the glass in the coolest part of the intermediate house is a suitable position for the Comparettias, and on this the pots or baskets in which the plants are grown may be placed, but many cultivators prefer small pans suspended from the roof. Fibrous peat mixed with a little sphagnum is the best compost for them, and which should be kept constantly moist, the quantity of moisture being, of course, regulated according to the season. A light shading on hot bright days must also be used.

Comparettia coccinea.

Stems fusiform, slightly elongated, 1—2 inches long, di-triphyllous. Leaves narrowly lanceolate, acute, 2—3 inches long, leathery, purplish beneath. Scapes nodding, as long again as the leaves, 5—7 flowered; bracts small, scale-like. Flowers an inch across vertically; sepals and petals ovate, acute, light yellow bordered with orange-red, the lateral sepals connate and concealed by the lip; lip three-lobed, the basilar lobes auriculate with two raised lines between them; the intermediate lobe broad, spreading, sub-quadrate or transversely oblong, deeply emarginate, bright scarlet; spur slender, longer than the blade, yellowish. Column whitish, rostellum beaked.

Comparettia coccinea, Lindl. in *Bot. Reg.* 1838, t. 68. Rchb. in Walp. Ann. VI. p. 688. *Illus. hort.* 1866, pl. 472.

This is probably a rare species, for although introduced more than half a century ago it is now but seldom seen in the orchid collections of Europe. It was first imported from Brazil by Messrs. Loddiges in 1837, but it seems to have been subsequently lost. About the year 1865 it was re-introduced from the neighbourhood of Rio de Janeiro by M. Ambroise Verschaffelt, of Ghent, through his correspondent M. Pinel.

C. falcata.

> "Pseudo-bulbs clustered, small, oblong, more or less sheathed with scales, monophyllous. Leaves oblong-lanceolate, acute, 1½—2½ inches long. Scapes slender, purplish, 7—9 inches, pendent, loosely racemose towards the extremity, 4—7 (or more) flowered; bracts distant, small and scale-like. Flowers about an inch in diameter, purplish red, almost crimson; dorsal sepal and petals free, concave; lateral sepals connate, placed immediately under the labellum and spurred; lip broadly obcordate, emarginate with an elevation on the claw, bicalcarate at the base, the two spurs enclosed by the larger sepaline spur which is about as long as the blade of the labellum."—*Botanical Magazine.*

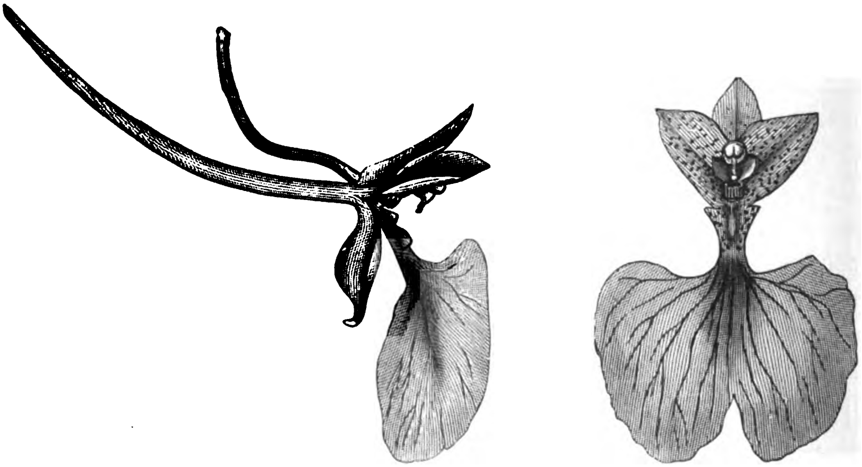
Comparettia falcata, Pöppig et Endl. Nov. Gen. et Sp. I. p. 42 (1835). *Bot. Mag.* t. 4980. Rchb. in Walp. Ann. VI. p. 688. *Lindenia, IV.* t. 163. Williams' *Orch. Alb. VIII.* t. 359. C. rosea, Lindl. in Bot. Reg. 1840, misc. No. 186. Paxt. *Mag. Bot. X.* p. 1. Van Houtte's *Fl. des Serres, II.* t. 6 (1846).

Comparettia falcata, the type species of the genus, was discovered by Pöppig some time prior to 1835 in Ecuador, between Cassapi and Pampayaco (not found on modern maps). The earliest notice of it as a horticultural plant occurs in 1840, when a Comparettia was cultivated by Messrs. Loddiges, who informed Dr. Lindley that they had imported it from the Spanish Main. This was named *C. rosea* by Dr. Lindley and was afterwards figured under that name in Paxton's *Magazine of Botany*, but rightly reduced to a synonym of *C. falcata* by Reichenbach in his synopsis of the genus in Walper's *Annales Botanices.* It was next found by Linden in the Venezuelian province of Merida, and subsequently imported by him from that region through his relative Louis Schlim. It has since been gathered in Guatemala, Cuba, Santa Martha, Ecuador and other places, thus proving the species to be very widely dispersed.

The region inhabited by *Comparettia falcata* may be thus briefly sketched. In latitude it occurs from 2 S. to 16 N., that is, from Central Ecuador to Guatemala. Its lowest vertical limit in Guatemala is about 3,200 feet elevation, gradually increasing to 4,000 feet at the equator, the highest corresponding limits being estimated at 4,500 and 5,700 feet. The climate of this region is rather changeable, not only with respect to the temperature but also with respect to the periodical rainfall and the hygrometric condition of the atmosphere. The mean temperature of the entire region is about 18° C. (64° F.), but the difference between the annual maximum mean and the annual minimum mean of the warmest and coldest month is inconsiderable; it is only 1·5°—2° C. (2°—3° F.) in Colombia and Ecuador, but in Guatemala it is 6·5°—7·5° C. (12°—14° F.). The quantity of moisture in the atmosphere varies somewhat according to the season, but there is sufficient ground to conclude that during the wet season it is probably of uniform proportion over the entire zone.

Comparettia falcata is very particular as to the tree on which it grows; in Guatemala it is found on oaks and oranges with but few exceptions; in other places it selects the Guava tree (a species of Inga). The woods in which it appears are usually of a thinly set copse-wood character or in park-like savannahs. The plants vary with locality; in Guatemala they are small, producing short wiry scapes with only three to five flowers but intensely coloured; in some parts of Colombia they are much longer and produce strong panicles of twenty-five to forty flowers.

Rodriguezias (Burlingtonias), Trichocentrums and Ionopses grow under much the same conditions as this plant.*



Comparettia Macroplectron, side and front view of flower.
(From the *Gardeners' Chronicle.*)

C. Macroplectron.

Stems about an inch long, sheathed by rigid scales, usually monophyllous, but sometimes diphyllous, in which case the leaves are unequal. Leaves linear-lanceolate, acute, 3—5 inches long. Scapes slender, sub-pendulous, 18—24 inches long, dull crimson, racemose, rarely paniculate along the distal half, 10—15 flowered. Flowers nearly 2 inches across vertically; dorsal sepal oblong, whitish, apiculate, sometimes spotted with purple, keeled behind; the lateral two connate into a boat-shaped body at the base of which depends the slender spur nearly two inches long; petals similar and equal to the dorsal sepal; lip broadly clawed with two small triangular auricles at the base from which two slender spurs extend into the sepaline spur to about half its length; the blade sub-orbicular, deeply emarginate, the auricles and claw white dotted with rose-purple, the blade light rose reticulated with purple. Column white.

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* F. C. Lehmann in Gard. Chron. XX. (1883), p. 24.

Comparettia Macroplectron, Rchb. in Gard. Chron. X. (1878), p. 524. Id. XI. (1879), p. 398; XVIII. (1882), p. 616; and XXIV. (1885), p. 365, icon. xyl. Williams' *Orch. Alb. II.* t. 65. *The Garden, XXX.* (1883), t. 385.

The largest-flowered species yet introduced but less brilliant in colour than the others; it is also distinguished from them by its much larger spur. It was originally discovered by Señor Triana, a Colombian botanist, and introduced by Messrs. Low and Co. in 1878.

C. speciosa.

Stems very short, sub-cylindric, sheathed with pale membraneous, acute scales. Leaves oblong-lanceolate, acute, 4—6 inches long. Scapes two—three times as long as the leaves, terminating in a lax 7—10 flowered raceme; bracts small, subulate, acute. Flowers 1½ inch across vertically, bright orange-scarlet; dorsal sepal and petals ovate, acuminate; the lateral sepals connate into a boat-like body, very acute at the apex; lip shortly clawed with two basal auricles and a sub-quadrate, emarginate blade; sepaline spur slender, longer than the stalked ovaries, obscurely pubescent. Column short with two small green wings; anther white and beaked.

Comparettia speciosa, Rchb. in Gard. Chron. X. (1878), p. 524. Williams' *Orch. Alb. V.* t. 233.

Discovered on the eastern Cordillera of Ecuador in 1877 by Edward Klaboch, by whom it was introduced into European gardens. It is chiefly distinguishable from *Comparettia falcata* by its larger flowers of a different colour, and especially by its elongated spur.

TRICHOCENTRUM.

Pöppig et Endl. Nov. Gen. et Sp. II. p. 11, t. 115 (1835). Benth. et Hook. Gen. Plant. III. p. 559.

Trichocentrum is botanically distinguished from Comparettia chiefly by the following characters:—

The floral spur is simple, that is to say, it is produced from the labellum only, and is parallel with the ovary (not divergent). The lip is adnate to the base of the column, not continuous with it. The inflorescence is much shorter and fewer-flowered.

About a dozen species are known to science, which admit of a division into two sections according to their habit—one with flat and horizontal leaves, as *Trichocentrum albo-purpureum, T. maculatum,* etc.; and the other with equitant, vertical leaves, as *T. triquetrum.* The Trichocentra are dispersed over tropical America from Mexico to Brazil; they are dwarf stemless plants with tufted leathery leaves that affix themselves to the branches and trunks of trees, some occurring on the Cordilleras of the Andes growing under conditions described in page 166, others along the hot damp valleys of Guiana and northern Brazil.

The genus was founded by Pöppig and Endlicher on *Trichocentrum pulchrum,* a species detected by the first-named botanist near Pampayaco in Peru (Ecuador?), but which has not been introduced into European gardens. The generic name is derived from θρίξ τριχὸς, "a hair," and κέντρον, "a spur," probably in reference to the slender spur of several of the species, but as Dr. Lindley remarked, the applicability of the name is not apparent nor is it explained by the author.*

Cultural Note.—Affixed to blocks of wood or placed in shallow pans and suspended near the glass is the most suitable arrangement for all the species of Trichocentrum yet introduced. The temperature is suggested by the geographical station of the species; for those inhabiting the Cordilleras of the Andes an intermediate temperature is sufficient, while those from the hot valleys of Guiana and Brazil should be placed in the East Indian house.

Trichocentrum albo-purpureum.

Leaves oblong or oblong-lanceolate, acute, 3—5 inches long, coriaceous, almost fleshy. Peduncles very short, bi-bracteate, 1—2 flowered. Flowers 1½—2 inches in diameter; sepals and petals similar, elliptic-oblong, obscurely keeled behind, tawny brown with greenish tips, the sepals acute, the petals obtuse; lip with a short broad claw, sub-quadrate, two-lobed at the apex; white with a large purple spot on each side of the crest which consists of four thin keels, in front of which is a buff-yellow spot; spur slender, cylindric, whitish. Column short, produced above into two falcate horns.

Trichocentrum albo-purpureum, Rchb. in Gard. Chron, 1866, p. 219, icon. xyl. *Bot. Mag.* t. 5688. Williams' *Orch. Alb. IV.* t. 204. *Lindenia, II.* t. 85.

* Bot. Reg. sub. 1951.

One of the finest species in the genus and that which is most generally cultivated. It was introduced by M. Linden, it is believed, from the Rio Negro region in northern Brazil; it flowered for the first time in this country in the collection of the late Mr. Wilson Saunders, at Hillfield, Reigate, in 1866.

T. fuscum.

Leaves shortly petiolate, oblong, acute, 3—4 inches long. Peduncles very short, 1—2 flowered. Flowers a little more than an inch across vertically; sepals and petals similar, ovate, acute, purplish green; lip broadly oblong, dilated and two-lobed at the apical end, bilamellate and prolonged into a slender spur at the base, white with a rose-purple blotch on each side of the lamellæ. Column short with two obovate, denticulate wings.

Trichocentrum fuscum, Lindl. in *Bot. Reg.* t. 1951 (1837). *Bot. Mag.* t. 3969. Rchb. in Walp. Ann. VI. p. 545.

Introduced from Mexico in 1835 by Mr. Knight, our predecessor at the Royal Exotic Nursery, where it flowered in July of the following year.

T. maculatum.

Leaves linear or lanceolate-oblong, acute, 2—3 inches long. Peduncles as long as the leaves, 1—2 flowered. Flowers 1½ inch across vertically; sepals and petals broadly oval-oblong, obtuse, white with the central area densely spotted with rose; lip obovate, two-lobed in front, the apical area coloured like the sepals and petals, the basal area with two longitudinal shallow keels, bright yellow dotted with red; spur slender, as long as the pedicel and ovary, pale green. Column wings spreading, denticulate, yellow spotted with red.

Trichocentrum maculatum, Lindl. Orch. Lind. p. 24 (1846). Rchb. in Walp. Ann. VI. p. 545.

Originally discovered by Linden in 1842 growing on old trees at an elevation of 4,500 feet on the Sierra Nevada of Santa Martha in northern Colombia, and subsequently gathered by Schlim and Wagener near Ocaña, whence it has since been occasionally imported. It is a handsome species that has appeared within the last few years at the Royal Horticultural Society's meetings under various names which are here purposely suppressed to avoid a burdensome unauthoritative synonymy.

T. Pfavii.

Leaves ligulate-cuneate, sub-acute, 3—4 inches long. Peduncles shorter than the leaves, 1—2 flowered. Flowers about 1½ inch across vertically;

sepals and petals similar and sub-equal, spathulate, obtuse, white with a large brown blotch near the base; lip broadly clawed, the claw auriculate and with two short keels; the blade fan-shaped, two-lobed, dentate, white with a large red spot at the base; spur conic, very short. Column wings roundish oblong, spotted with brown at the margin.

Trichocentrum Pfavii, Rchb. in Gard. Chron. XVI. (1881), p. 70. Id. XVII. (1882), p. 117, icon. xyl.

One of the discoveries, in Central America, of the Swiss orchid collector Richard Pfau, who has communicated to the horticultural press some useful notes on the climate of that region and the conditions under which orchids grow there. *Trichocentrum Pfavii* was introduced in 1881 by Messrs. Sander and Co.

R. triquetrum.*

"Leaves vertical, equitant, 6 inches long, ½ inch wide at the base, gradually tapering to an acute apex. Peduncles axillary, about an inch long, with several conduplicate lanceolate-linear acute bracts, about ½ inch long. Pedicel and ovary 1¼ inch long, triquetrous. Sepals ovate-lanceolate, acute, pale straw-yellow, the lateral two prolonged behind and adnate to the spur of the lip; petals sub-orbicular, pale straw-yellow; lip reniformly orbicular, straw-yellow irregularly variegated and almost suffused on the disk with orange; base with two converging keels; spur slender, 1¼ inch long, tapering to the acute apex. Column stout, wings small and rounded."—R. A. Rolfe in Gard. Chron. IX. s. 3 (1891), p. 701.

Trichocentrum triquetrum, Rolfe in Gard. Chron. loc. cit. *Lindenia, VII.* t. 311.

A very distinct species and an interesting addition to the genus recently introduced from Peru by Messrs. Charlesworth, Shuttleworth and Co., of Heaton, Bradford.

RODRIGUEZIA.

Ruiz et Pav. Prod. Fl. Peruv. et Chili, p. 115, t. 25 (1794). Rchb. in Walp. Ann. VI. p. 690 (1863). Benth. et Hook. Gen. Plant. III. p. 559 (1883).

A well-established genus including about twenty species that are dispersed over tropical America from southern Brazil to Mexico and also the West India Islands. The essential characters of Rodriguezia are seen in the lateral sepals, labellum and column; the lateral sepals are connate, and in those species formerly included in Lindley's Burlingtonia they are joined in a very curious way, sometimes forming a boat-shaped body of singular appearance that is almost concealed by the labellum; the labellum is large and prominent as in the allied genera Comparettia and Trichocentrum, but the spur is very short, often reduced to a simple gibbosity projecting between the bases of the lateral sepals; the column is longer and more slender than in those genera.

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* Not seen by us.

Mr. Bentham followed Reichenbach in uniting Lindley's Burlingtonia with Ruiz and Pavon's Rodriguezia, assigning the following conclusive reason for doing so:—

> "Rodriguezia was originally confounded by Lindley with Robert Brown's Gomeza which has no spur, and when he afterwards separated the spurred species he unfortunately overlooked the fact that these were the true Rodriguezias of Ruiz and Pavon, and gave them the new name of Burlingtonia."*

The Rodriguezias are dwarf epiphytes usually with short monophyllous pseudo-bulbs springing from a rhizome that is sometimes much elongated, and from which in several species is produced a dense plexus of thread-like white roots that form a conspicuous feature of the plant.

The genus was dedicated by its founders to Emanuel Rodriguez, a Spanish physician and botanist of the last century.

Cultural Note.—Being of dwarf habit the Rodriguezias may be grown in pans or baskets suspended near the glass in an intermediate house. For those species of which the roots are developed as above described, most cultivators use sphagnum moss only, placed beneath the pseudobulbs on an ample drainage of broken crocks. A moist atmosphere almost to saturation during the growing season is indispensable.

Rodriguezia Batemanii.

Pseudo-bulbs ovoid, compressed and furrowed when old, monophyllous. Leaves oblong-ligulate, acute, 3—4 inches long. Racemes as long as the leaves, sub-pendulous, few-flowered; bracts triangular, acute, keeled, almost as long as the ovaries; dorsal sepal and petals whitish, the former oblong, acute, arched; the latter broader, obovate-oblong, streaked with rose-purple; the connate lateral sepals nearly equal to the dorsal one; lip broadly oblong, dilated and emarginate at the apical end, with two keels extending from the base to beyond the middle, white streaked with rose-purple; spur conic, very short.

Rodriguezia Batemanii, Pöpp. et Endl. Nov. Gen. et Sp. I. t. 70 (1835). Rchb. in Gard. Chron. 1866, p. 1042. Sanders' *Ref. Bot. II.* t. 128. Burlingtonia rubescens, Lindl. in Bot. Reg. sub. t. 1927 (1837).

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* Journ. Linn. Soc. XVIII. p. 326.

A very pretty species originally discovered by the German botanist Pöppig in 1830 on the Andes of Peru, near Maynas,* growing on calabash trees (*Crescentia Cujete*), and which after his return to Europe he dedicated to Mr. Bateman, who had paid him a visit at Leipzig where he had been appointed Professor of Botany. Nothing more was seen or heard of it till 1866, when it was re-discovered by Wallis near Moyabamba, it was supposed, and who sent it to M. Linden's horticultural establishment at Brussels. It was first cultivated in England by Bishop Sumner at Farnham Castle, and Mr. Wilson Saunders at Hillfield, Reigate.

R. candida.

Pseudo-bulbs about the size of a walnut, slightly compressed, monophyllous. Leaves oblong-lanceolate, acute, 4—6 inches long. Racemes as long as the leaves, pendulous, 4—7 flowered. Flowers fragrant, of semi-transparent texture, 2—3 inches across vertically, white with a bright yellow longitudinal bar on the lip that is sometimes rayed; the dorsal sepal obovate-oblong, emarginate; the lateral two much smaller, connate to two-thirds of their length and embracing the spur of the lip at their base; petals obovate, obtuse; lip with a channelled claw and obcordate, emarginate blade, multi-lamellate on the disk, the lateral lamellæ divergent. Column clavate, toothed at the apex.

Rodriguezia candida, Rchb. in Walp. Ann. VI. p. 695 (1863). Benth. Gen. Plant. III. p. 559. Burlingtonia candida, Lindl. in *Bot. Reg.* t. 1927 (1837). Id. Paxt. Fl. Gard. p. 158. *Fl. Mag.* t. 548. Williams' *Orch. Alb. I.* t. 18.

Introduced from Demerara by Mr. Bateman, in whose collection at Knypersley it flowered for the first time in April, 1835. It was afterwards detected by the brothers Schomburgk during their exploration of British Guiana on the sand hills and in the light forests near the river Demerara growing upon the branches of shrubs. Ever since its first introduction it has been generally recognised by amateurs of orchids as one of the most beautiful of Rodriguezias or Burlingtonias as it is better known in gardens.

R. decora.

Rhizome scandent, slender, jointed at intervals of about an inch. Pseudo-bulbs produced from the rhizome at intervals of 5—9 inches, ovoid, compressed, about an inch long with a linear-oblong, acute leaf springing from the base on one side and a larger apical one about 6 inches long. Scapes from the axils of the basal leaves, slender, erect, 12—15 inches high, terminating in a 10—15 flowered raceme; bracts small, membraneous, sheathing. Flowers 1½ inch long; sepals and petals white spotted with brown, the dorsal sepal elliptic-oblong, the lateral two narrowly oblong, connate to beyond the middle, all apiculate; petals elliptic-oblong, much broader than the sepals; lip with a broad claw on which are five raised lines, and a sub-orbicular two-lobed white blade. Column terete, prolonged into two erect, purple, hairy horns and two smaller and shorter smooth pale ones.

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* This name seems to have disappeared from modern maps.

Rodriguezia decora, Rchb. in Walp. Ann. VI. p. 692 (1863). Benth. Gen. Plant. III. p. 559. Burlingtonia decora, Lemaire, Jard. Fleur. II. t. 188 (1851). Van Houtte's *Fl. des Serres, VII.* t. 716. Lindl. in Paxt. Fl. Gard. III. p. 100, icon. xyl. *Bot. Mag.* t. 4834.

var.—picta.

Pseudo-bulbs less compressed; leaves shorter and more acute; sepals and petals blotched with sanguineous purple.

R. decora picta, Benth. Gen. Plant. III. p. 559. Burlingtonia decora picta, *Bot. Mag.* t. 5419.

This species is well distinguished among Rodriguezias by its scandent habit, its curiously-shaped but very pretty flowers, and especially by the horn-like prolongations of the column.* It was first introduced from the province of São Paulo in southern Brazil by M. de Jonghe through his collector Libon; it flowered for the first time in Europe in M. Jacob Makoy's nursery at Liége in May, 1851. The variety was received from southern Brazil by Mr. Bateman in 1863.

R. granadensis.

Leaves lanceolate, acute, 3—4 inches long, in tufts of threes and fours, the uppermost pair enclosing a small monophyllous pseudo-bulb about the size of a filbert. Racemes pendulous, longer than the leaves, 5—7 flowered. Flowers an inch in diameter, white with a yellow blotch on the disk of the lip; dorsal sepal and petals sub-equal, ovate, acute; lateral sepals much narrower and connate into a boat-shaped body; lip clawed, obovate, emarginate. Column narrowly winged.

Rodriguezia granadensis, Rchb. in Walp. Ann. VI. p. 695 (1863). Burlingtonia granadensis, Lindl. Orch. Lind. p. 24 (1846).

Discovered by Linden in 1842 near Pamplona on the eastern Cordillera of New Granada, but not introduced till many years afterwards. It was detected by one of our own collectors in 1887 near Mantanza growing on the small twigs of shrubs and low trees overhanging the river Surito, a confluent of the Magdalena. It is a pretty dwarf species well worthy of cultivation.*

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* Very near *Rodriguezia decora* and quite agreeing with it in its scandent habit is *R. rigida*, figured in Lindley's *Sertum Orchidaceum*, t. 36, and Paxton's *Magazine of Botany, VIII.* p. 193. It was cultivated by Messrs. Loddiges more than half a century ago, but we find no mention of it since.

R. pubescens.

Leaves narrowly ligulate, acute, 5—7, very leathery. Racemes pendulous, longer than the leaves, 10—15 flowered. Flowers nearly 1½ inches in diameter, white with a yellow blotch at the base of the lip; dorsal sepal oblong-lanceolate, acute; lateral sepals much narrower, connate and with a small gibbosity at the base; petals obovate-oblong, obtuse; lip obovate, two-lobed in front, auricled at the base, the auricles minute, hastate, erect; the disk with three unequal raised lines. Column downy; wings minute.

Rodriguezia pubescens, Rchb. in Bot. Zeit. X. p. 771 (1852). Id. in Walp. Ann. VI. p. 694. *Lindenia, VII.* t. 306. Gard. Chron. XI. s. 3 (1892), p. 426, icon. xyl. R. Lindenii, Coigniaux in Linden's Journ. des Orch. III. pp. 10, 12, fig. 1. Burlingtonia pubescens, Lindl. in Paxt. Fl. Gard. I. p. 158 (1850—51).

The following, by Dr. Lindley in Paxton's *Flower Garden*, loc. cit., is the earliest notice we find of this species:—

> "This beautiful Rodriguezia was exhibited at a meeting of the Horticultural Society some years ago when it received a silver medal. It had been sent to Mr. John Knowles, of Manchester, from Pernambuco, where it appears to be very rare. It is not now, however, introduced for the first time, for we have in our possession a dried specimen communicated by the late Mr. George Loddiges in 1846, at which time we named it *pubescens* in allusion to the down on the column which is not found in the other drooping, white-flowered species."

Quite recently *Rodriguezia pubescens* has been re-introduced by L'Horticulture Internationale of Brussels, and by Messrs. Sander and Co. of St. Albans. It is one of the most chaste and attractive species of the genus.

R. secunda.

Pseudo-bulbs oval-oblong, compressed, 1½—2 inches long, mono-diphyllous. Leaves linear-lanceolate or linear-oblong, acute, 5—9 inches, long, more or less conduplicate, very leathery. Scapes as long as the longest leaves, pale green tinged with dull crimson, racemose along the distal half, nodding or arched, many-flowered. Flowers distichous and secund (all turned in one direction whence the specific name), on pale rose-pink pedicels sheathed at the base by a small lanceolate, acute bract; sepals and petals of a uniform rose-pink, the upper sepal oval-oblong, concave on the inner side; the lateral sepals connate into a boat-shaped body, gibbous at the base, attenuated at the apex;

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* Very near *Rodriguezia granadensis*, if not a variety of it, is *R. Caloplectron* (Rchb.), figured in the *Gartenflora* of 1892, t. 1372.

petals similar to the upper sepal but broader; lip obovate-oblong, emarginate with a furrowed callosity at the base, deeper in colour than the other segments. Column terete, short, white.

Rodriguezia secunda, H. B. K. Nov. Gen. et Sp. I. p. 367, t. 92 (1815). *Bot. Reg.* t. 930 (1825). *Bot. Mag.* t. 3524 (1836). Williams' *Orch. Alb. VIII.* t. 351. R. lanceolata, Lodd. *Bot. Cab.* t. 676 (not of Ruiz. et Pav.).

Comparatively few orchids have been longer known in British gardens or were more generally cultivated during the second quarter of the present century than *Rodriguezia secunda,* but like others that were popular during that period, it has receded before the more showy kinds since imported from the same region over which it is spread, although it is still met with in many collections. It was originally introduced from Trinidad about the year 1818, but it had been discovered many years previously by Humboldt and Bonpland in the neighbourhood of Carthagena in northern Colombia growing on the trunks of *Crescentia Cujete* (The Calabash Tree). It was afterwards brought from Demerara by Capt. Bispham, of the Liverpool merchant service, and cultivated by Mr. Parker of that city. The brothers Schomburgk during their exploration of British Guiana, 1840—44, found it generally dispersed over the whole country; they also noted a variety with darker flowers growing on the banks of the Demerara river and which they called *sanguinea.** It is also very common around Para in Brazil, the Mango trees being full of it, and it is almost the only orchid found within the city itself.† The geographical range of *Rodriguezia secunda* is thence a very extensive one. It is variable in habit and colour, the latter ranging from sanguineous red to pale rose.

R. venusta.

Rhizome elongated. Leaves linear-ligulate, acute, conduplicate at the base, obliquely emarginate, 6—9 or more inches long, produced in tufts of threes and fours, between the upper pair of which the small oblong, monophyllous pseudo-bulb is seated. Racemes pendulous, 5—9 flowered. Flowers 1½ inch long, pure white with an oblong yellow blotch on the lip and very fragrant; upper sepal broadly ovate, acute, concave and bent forwards; lateral sepals narrowly oblong, connate into a boat-like organ, very acute at the apex and enclosing the spur of the lip; lip clawed, broadly obovate, with a deep sinus in the apical margin, in which is a small triangular lobule; the disk with two wavy keels that are orange-red along the edge. Column with a horn-like auricle on each side of the stigma and two small purple teeth above them.

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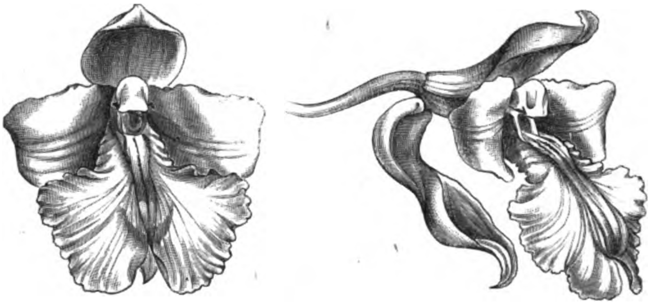
* Reisen in Britisch-Guiana, III. p. 312.

† E. S. Rand in lit.

Rodriguezia venusta, Rchb. in Walp. Ann. VI. p. 194. Burlingtonia venusta, Lindl. in Bot. Reg. sub. t. 1927 (1837). Id. *Sert. Orch.* t. 2. *Illus. hort.* 1858, t. 188. B. fragrans, Lindl. in Bot. Reg. sub. t. 1927. Williams' *Orch. Alb. VIII.* t. 363.

This beautiful species was discovered in the early part of the present century by the French traveller and naturalist, Descourtilz, growing on the topmost branches of Cedrela trees, near Bananal, in the Brazilian province of Minas Geraes. The drawings which he subsequently published led Dr. Lindley to conclude that he had detected two species of Rodriguezia, one with drooping the other with erect racemes, to which therefore that excellent orchidologist gave separate names with a brief diagnosis of each in the *Botanical Register*, sub. t. 1927, published in 1837, distinguishing that with pendulous racemes as *venusta,* and that with erect racemes as *fragrans.* Nothing, however, appears to have occurred since to verify this conclusion; no tangible difference is observable in the plants cultivated under the names of *Rodriguezia fragrans* and *R. venusta.*



Rodriguezia venusta.

The date of the first introduction of *Rodriguezia venusta* is uncertain. In 1856 it was sent to M. Ambroise Verschaffelt's horticultural establishment at Ghent by his Brazilian correspondent M. Pinel; and this is the earliest authentic date we find respecting it, but it was then known to have been in cultivation many years previously.

TRICHOPILIA.

Lindl. Nat. Syst. Bot. ed. II. p. 446, and Bot. Reg. sub. t. 1863 (1836). Rchb. Xen. Orch. II. p. 98 (1865). Benth. et Hook. Gen. Plant. III. p. 559.

Trichopilia includes about fifteen species; two of them, *T. laxa* and *T. fragrans*, were constituted a separate genus by Lindley under the name of Pilumna,* but as they possess no definable characters by which they may be technically distinguished from the older genus Trichopilia, they were referred to it both by Reichenbach and by Bentham. Reichenbach also added *Helcia sanguinolenta*,† an orchid discovered by Hartweg on the Ecuadorean Andes, and to which Lindley had given separate generic rank in the erroneous belief, derived from an examination of the dried specimen of the discoverer and therefore perfectly excusable, that the column and lip were attached in a manner different from Trichopilia which is not the case. Mr. Bentham followed Reichenbach in including Lindley's Helcia in Trichopilia, and he also referred another so-called monotypic form to the same genus, Reichenbach's Oliveriana,‡ detected by Wallis near Medellin in New Granada, not known in cultivation, but which appears to possess all the essential characters of Trichopilia.

The genus as now circumscribed is well distinguished by the following floral characters:—

> The *sepals* and *petals* are nearly equal and similar, narrow in proportion to their length and in a few species, spirally twisted.
>
> The *lip* is large, more or less funnel-shaped (obscurely so in *Trichopilia sanguinolenta* and *T. hymenantha*), and projecting forwards mostly at a right angle to the other segments; the short *ungius* or claw and the small basal lobes are adnate to the column.
>
> The *column* terminates in a curious hood-like appendage that is more or less toothed (ciliate-dentate) but sometimes lobed.

In their vegetation the Trichopilias are dwarf plants with an inconspicuous rhizome, so that the pseudo-bulbs are usually more or less crowded.

> The pseudo-bulbs are often elongated and nearly flat; they are always monophyllous. The leaves are but a few inches long, leathery in texture and dark green. The peduncles are usually pendulous and few-flowered, rarely erect.

The geographical area over which the species are dispersed is, comparatively speaking, limited. They occur on the Andes of South America at a moderate elevation, from the equator northwards to Caracas, and crossing the isthmus they spread through Costa Rica into southern Mexico. Three or four of the most admired species have their home on the volcano of Chiriqui and the not very distant peak of Turialba, and this is the greatest aggregation of the species known. The genus was founded by Lindley on the Mexican species *Trichopilia tortilis*, the very curious appendage at the apex of the column suggesting the generic name which is derived from *θρίξ*, *τριχὸς*, "a hair," and *πίλιον*, "a cap." This remarkable structure is shown in the annexed figure of the column of the type species.

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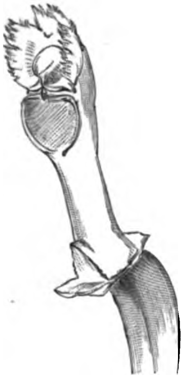
* Bot. Reg. 1844, misc. No. 74.

† Xen. Orch. II. p. 106.

‡ Linnæa, XLI. p. III.



Cultural Note.—The Trichopilias may be grown in pots or in teak baskets, many cultivators preferring the latter on account of the facility with which they can be suspended near the glass, where the plants can receive as much light as possible in the short and dull days of our changeable climate. A mixture of peat and sphagnum with good drainage is the best compost for them, and on this the pseudo-bulbs should be placed, not inserted in it. For the Central American and Mexican species, a temperature that can be raised to 21° C. (70° F.) during the growing season is the most suitable. *Trichopilia fragrans* and its varieties may be grown in the Odontoglossum house.

Trichopilia coccinea.

Pseudo-bulbs narrowly oblong, compressed, 2—3 inches long. Leaves ligulate, acute, 6—9 inches long. Peduncles deflexed, as long as the pseudo-bulbs, sheathed at the base by closely imbricating bracts, one-flowered. Sepals and petals linear-lanceolate, acute, 2½ inches long, more or less twisted, brownish green; lip 3 inches long, four-lobed, the basal lobes rolled over the column into the form of a wide-mouthed funnel, white externally, deep carmine-crimson within; the two front lobes nearly flat, sub-orbicular, rose-carmine striated, paler, sometimes white at the margin.

Trichopilia coccinea, Lindl. in Paxt. *Fl. Gard. II.* p. 80, pl. 54 (1851—2). Morren in Belg. hort. 1874, p. 91.

var.—crispa.

Peduncles two-flowered; the sepals and petals sometimes tinted with dull rose-carmine, the margin of the lip irregularly but somewhat strongly crisped.

T. coccinea crispa, Morren in Belg. hort. 1874, p. 92 (in part). T. crispa, Lindl. in Gard. Chron. 1857, p. 342. T. gloxiniæflora, Klotzsch.

One of the handsomest of the genus and occasionally confused with *Trichopilia marginata,* from which it differs in its longer, narrower and more compressed pseudo-bulbs; in its longer and narrower leaves; in its twisted sepals and petals that are differently coloured; and in its narrower and curved funnel-shaped lip, the front lobes of which are not depressed. It was discovered in Central America by Warscewicz in 1849 and introduced by him into European gardens shortly afterwards. The variety which differs from the type only in the characters described above was first cultivated by Mr. Rucker, of West Hill, Wandsworth; it appears to be more rare than the typical form.

Trichopilia coccinea, Lindl.; *T. crispa,* Lindl.; *T. gloxiniæflora,* Klotzsch; *T. marginata,* Henfrey; and *T. lepida,* Veitch, represent a series of forms in which more definite characters are wanting to differentiate them specifically. In their vegetation there is a greater divergence than in the structure of their flowers, especially in *T. coccinea* and *T. marginata,* as pointed out above; for garden use therefore these may be conveniently retained as distinct. Adopting Lindley's suggestion,* we have reduced *T. crispa* to a variety of *T. coccinea,* and following Reichenbach we have made *T. gloxiniæflora* a synonym of the former.† *T. lepida* is manifestly a variety of *T. marginata* with which Warner's *T. crispa marginata* is synonymous. It only remains to be noted that all these forms have a common origin and have been imported mixed together.

T. fragrans.

Pseudo-bulbs oblong, much compressed with acute edges, 3—5 inches long. Leaves oblong or oblong-lanceolate, acute, 7—10 inches long, almost sessile on the apex of the pseudo-bulbs. Peduncles erect or sub-erect, 2—4 flowered; pedicels (including ovary) 2—3 inches long; bracts ovate-oblong, sub-acute, sheathing. Flowers very fragrant, pure white with a circular yellow spot near the base of the lip, the sepals and petals sometimes with a slight tinge of green; sepals and petals nearly uniform, linear-lanceolate, acuminate, 2—2½ inches long with undulated margins; lip clawed, the claw adnate to the base of the column and then convolute over it; the blade large, expanded, broadly oblong, obscurely four-lobed. Column terete with two rounded entire wings in front and with a fimbriated hood at the apex.

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* Gard. Chron. 1857, p. 342.

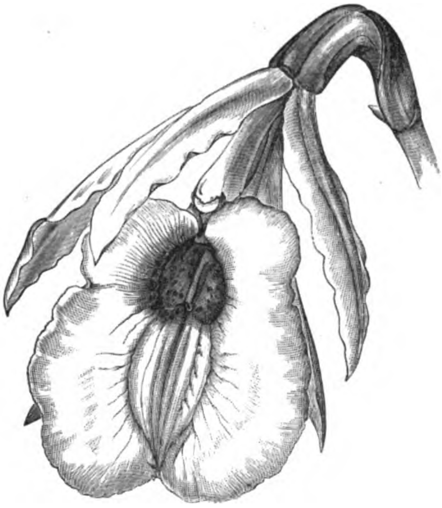
† Xen. Orch. II. p. 102. The late Professor Morren, of Liége, adopted this view in his synopsis of Trichopilia published in the *Belgique horticole* of 1874, but unfortunately mixed up *T. marginata* with *T. coccinea.*

Trichopilia fragrans, Rchb. in Hamb. Gartenz. 1859, p. 229. Id. Xen. Orch. II. p. 100. Jennings' *Orch.* t. 38. Saunders' *Ref. Bot. II.* t. 127. T. Backhouseana, Rchb. in Gard. Chron. V. (1876), p. 816. T. Lehmanni, Regel's *Gartenfl.* 1888, t. 1276. Pilumna fragrans, Lindl. in Bot. Reg. 1844, misc. No. 74. *Bot. Mag.* t. 5035.*

var.—nobilis.

Pseudo-bulbs shorter and thicker; leaves shorter and broader. Flowers a little larger with the sepals and petals always pure white, the blade of the lip a little broader with the yellow spot enlarged.

T. fragrans nobilis, *Illus. hort.* 1872, t. 94. T. fragrans, *Fl. Mag.* N.S. t. 21. T. candida, Lindl. Orch. Lind. No. 640. Pilumna nobilis, Rchb. in Linnæa, XXII. p. 843. Williams' *Orch. Alb. III.* t. 128.



Trichopilia fragrans.

Trichopilia fragrans was originally discovered by Hartweg about the year 1841 near Popayan in southern Colombia, and a brief description of the flower from his herbarium specimen was published by Lindley in the *Botanical Register* of 1844. In the meantime a Trichopilia had been detected on the Sierra Nevada of Merida in western Venezuela by Linden who named it *T. candida,* a name which Lindley adopted in his enumeration of the orchids discovered by Linden, but Linden's plant was afterwards referred to

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* Reichenbach in Xen. Orch. II. p. 100, refers this to his *Trichopilia Wageneri.* There is, however, but little to distinguish it from *T. fragrans,* except the shorter and narrower anterior lobes of the labellum and the smaller orange-yellow spot at its base. As *T. fragrans* is widely dispersed over the Colombian Andes, *T. Wageneri,* as represented in the *Botanical Magazine,* appears to be nothing more than a geographical form of it.

T. fragrans by Reichenbach* and later by André to the *T. nobilis* of that author which he rightly reduced to a variety of *T. fragrans* on the occasion of its being figured in the *Illustration horticole.*† But so many intermediate forms have appeared in recent importations that the marks of distinction between *T. fragrans* and the variety *nobilis* observable in the earliest introduced plants have practically vanished. The *T. Lehmanni* of Regel was gathered by Mr. Lehmann on the western Cordillera of Colombia; no definite specific character is discoverable in the figure in the *Gartenflora* by which it may be separated from *T. fragrans.*

The date of the first introduction of *Trichopilia fragrans* into European gardens is uncertain. The plant figured as *T. fragrans* in the *Botanical Magazine* was cultivated by Lady Dorothy Nevill at Dangstein in 1857, and this is the earliest mention we find of its being in cultivation in this country. A few years later it was imported from New Granada in considerable quantities by Messrs. Low and Co., M. Linden, and ourselves.

T. Galeottiana.

Pseudo-bulbs narrowly oblong, much compressed with acute edges, 3½—5 inches long. Leaves elliptic-oblong, sub-acuminate, 5 – 7 or more inches long, leathery, dark green. Peduncles procumbent, as long as the pseudo-bulbs, 1—2 flowered. Sepals and petals similar, narrowly lanceolate, apiculate, obscurely keeled behind, pale turmeric-yellow; lip sub-orbicular, cuneate, adnate to the column at the base, then convolute over it, the blade four-lobed, light yellow with a darker yellow disk that is sometimes spotted with red. Column terete, greenish, denticulate at the apex.

Trichopilia Galeottiana, A. Rich. in Ann. Sc. Nat. 1845, p. 26. Rchb. Xen. Orch. II. p. 103. Id. in Gard. Chron. 1865, p. 770. Morren in Belg. hort. 1874, p. 96. T. picta, Lemaire in *Illus. hort.* 1859, t. 225. T. Turialvæ, Batem. in *Bot. Mag.* t. 5550 (not of Rchb.).

Discovered some time prior to 1845 by Galeotti, an Italian botanical explorer, near Teotaleingo in Mexico growing on oaks at an elevation of 3,000 feet. It was introduced into European gardens by M. Ambroise Verschaffelt, of Ghent, in 1859 through his collector Ghiesbreght who gathered it in the district of Chiapu. A few years later it became generally distributed among the orchid collections of this country, and was described by Mr. Bateman in the *Botanical*

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* Walp. Ann. VI. p. 680.

† Vol. XIX. (1872), p. 96.

Magazine as *T. Turialvæ* in the erroneous belief that it was the species so named by Reichenbach that had been discovered by Wendland in Central America. It is well distinguished among Trichopilias by its light yellow flowers.

T. hymenantha.

Pseudo-bulbs none. Leaves in tufts of 4—5, linear, acuminate, 5—10 inches long, fleshy, sub-terete, channelled on the face. Peduncles slender, pendulous and racemed, 4—6 or more flowered; bracts ovate, acute, as long as the slender ovaries. Flowers nearly 2 inches in diameter; sepals and petals similar and sub-equal, linear-lanceolate, acuminate, light straw-yellow, but sometimes white; lip broadly oval, abruptly acuminate, concave at the base, fringed at the margin, white sparingly spotted with deep claret-red and covered with crystal dots. Column slender, terete, hooded at the apex, the hood with denticulate margin.

Trichopilia hymenantha, Rchb. Xen. Orch. I. p. 15, t. 7 (1854); and II. p. 98. *Bot. Mag.* t. 5949. Morren in Belg. hort. 1874, p. 101.

Very little is recorded of this Trichopilia. It was first discovered by Schlim in the eastern Cordillera of New Granada near Ocaña, and was probably introduced by him. Reichenbach states that it was in the collection of Consul Schiller at Hamburgh in 1853, whence he obtained the materials for the description and figures in the *Xenia Orchidacea.* We find no further mention of it till it was figured and described in the *Botanical Magazine* of 1872, from a plant that flowered in our houses in the autumn of the preceding year.

Trichopilia hymenantha is readily distinguished among its congeners by the absence of pseudo-bulbs, by its long narrow fleshy leaves and by its nearly flat labellum. Notwithstanding the little favour accorded to it by cultivators, it is one of the most delicate of Trichopilias in the texture and colour of its flowers.

T. laxa.

Pseudo-bulbs oval-oblong, much compressed, 2—3 inches long. Leaves broadly lanceolate-oblong, acute, 8—12 inches long. Peduncles sub-pendulous, pale green mottled with dull crimson, racemose, 5—9 flowered; bracts spathaceous, broadly ovate, obtuse. Flowers about 3 inches in diameter; sepals and petals similar, linear-lanceolate, pale rose with a greenish median band; lip white, obcordate, cuneate, obscurely three-lobed, the basal lobes rolled over the column. Column triquetral, with a fimbriate hood at the apex.

Trichopilia laxa, Rchb. in Hamb. Gartenz. 1858, p. 229. Id. Xen. Orch. II. p. 100. Morren in Belg. hort. 1874, p. 101. Pilumna laxa, Lindl. in *Bot. Reg.* 1844, misc. No. 74; and 1846, t. 57.

This is one of the least interesting of the Trichopilias in a horticultural sense on account of the absence of attractive colours in its flowers. It was originally discovered by Hartweg at the same time and in the same locality as *Trichopilia fragrans*, viz., near Popayan in southern Colombia about the year 1841.

T. marginata.

Pseudo-bulbs broadly oblong, 1½—2 inches long. Leaves oblong, subacute, 6 inches long, very leathery. Peduncles short, sheathed by imbricating bracts, 2—3 flowered. Flowers with a curved pedicel and ovary, 2 inches long; sepals and petals linear lanceolate, acute, 2½ inches long, reddish crimson with white margins; lip funnel-shaped, obscurely four-lobed, the front lobes deflexed, rose-carmine, darker and striated towards the base, white externally. Column white, the apical hood three-lobed and denticulate.

Trichopilia marginata, Henfrey in Gard. Mag. July, 1851, with fig. Rchb. Xen. Orch. II. p. 102. T. coccinea, Hook. in *Bot. Mag.* t. 4857. Van Houtte's *Fl. des Serres, XIV.* t. 1490. Warner's *Sel. Orch. I.* t. 5 (crispa marginata). De Puydt, *Les Orch.* t. 43 (idem).

var.—lepida.

Flowers somewhat larger than the typical form; the white margin of the sepals and petals broader and interrupted with rose-pink spots; the margin of the lip similarly spotted and more crisped than in the commoner form.

T. marginata lepida, supra. T. lepida, Veitch ex Williams' *Orch. Alb. V.* t. 197. *Fl. Mag.* N.S. t. 98.

One of the handsomest species of the genus and one that has been most generally cultivated since its first introduction. It has been occasionally confused with *Trichopilia coccinea* and its variety *crispa* from which it is fairly distinguishable by the characters pointed out under that species. It was discovered by Warscewicz in 1849 on the volcano of Chiriqui in Central America and introduced by him into European gardens shortly afterwards. The variety *lepida* appeared amongst an importation of the species by ourselves in 1873; it is a very rare form.

T. rostrata.

Pseudo-bulbs narrowly oblong, much compressed, 4—6 inches long. Leaves linear-oblong acute, as long as the pseudo-bulbs, conduplicate at the base. Peduncles short, sub-erect, 2—3 flowered; bracts ovate-oblong, much shorter than the ovaries, pale green dotted with brown. Sepals and petals linear-ligulate, acute, 1½ inch long, twisted, obscurely keeled behind, light yellow-green; lip broadly oblong, emarginate, three-lobed, the side lobes rolled over the column into a tube but reflexed at their apex, the intermediate lobe spreading, white with some yellow markings on the disk and some orange spots and markings within the tube. Column prolonged at the apex into a fringed hood.

Trichopilia rostrata, Rchb. in Gard. Chron. 1872, p. 798. Saunders' *Ref. Bot. II.* t. 100.

Discovered in New Granada by one of Messrs. Low's collectors in 1866 and introduced by that firm a few years afterwards. It is now but rarely seen.

T. sanguinolenta.

Pseudo-bulbs ovate-oblong, compressed, 1—2 inches long. Leaves linear-oblong, acute, 4—6 or more inches long, narrowed below into a short channelled petiole. Peduncles ascending, about 3 inches long, sheathed at each joint by a brownish acute bract ¾ inch long, one- rarely two-flowered. Sepals and petals oblong, sub-acute, more than an inch long, light olive-green barred and spotted with chestnut-brown, the spots on the petals ocellated; lip oblong, two-lobed at the apex, the lobes slightly divergent, crisped and denticulate at the margin which is also incurved, with two erect basal auricles adnate to the column between which are two short protuberances; the auricles and crest yellow, the blade white spotted and marked in various ways with red-purple, the apical area white. Column terete, terminating in a fimbriated hood.

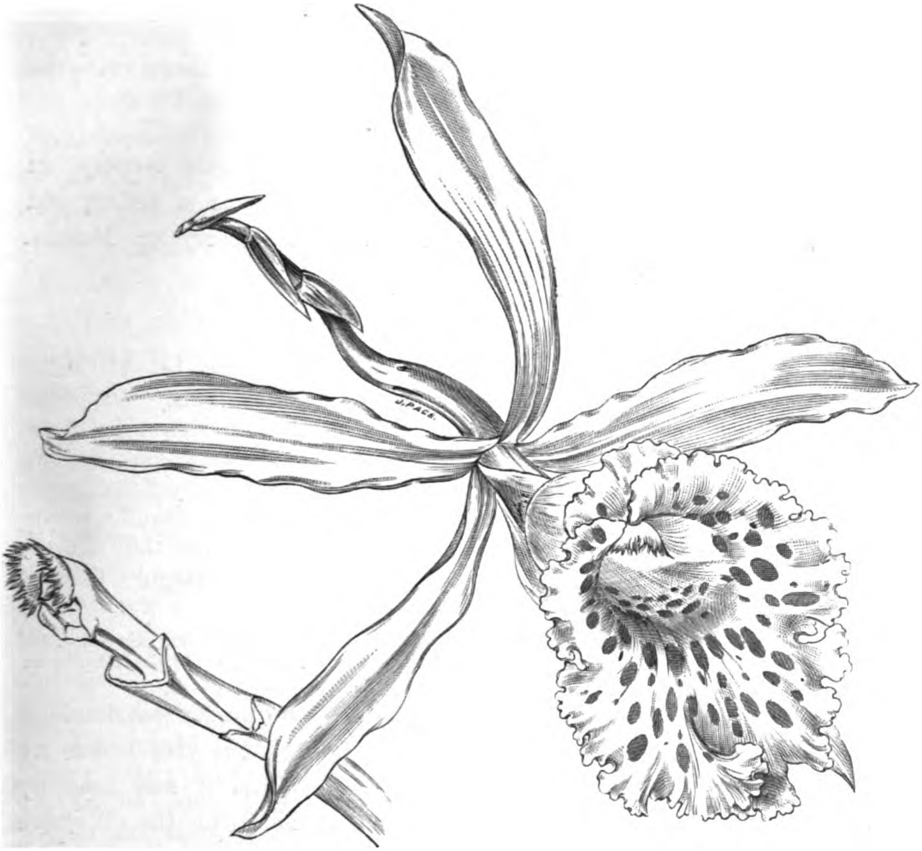
Trichopilia sanguinolenta, Rchb. Xen. Orch. II. p. 106, t. 131 (1865). Morren in Belg. hort. (1874), p. 102. Benth. in Journ. Linn. Soc. XVIII. p. 326. *Bot. Mag.* t. 7281. Helcia sanguinolenta, Lindl. in Bot. Reg. 1845, misc. No. 27. Id. in Paxt. Fl. Gard. II. p. 97, icon. xyl. Rchb. in Walp. Ann. VI. p. 682. *Illus. hort.* 1870, t. 31.

For the discovery of this curious and interesting orchid science and horticulture are indebted to the energy of Theodor Hartweg, who detected it near Paccho on the Ecuadorean Andes in 1841. He sent it with other orchids from the same region to the Horticultural Society of London in whose garden at Chiswick it flowered two or three years afterwards, but it seems to have been subsequently lost. It was re-introduced about the year 1869 by M. Linden through his collector Gustav Wallis. It is best known in gardens under the name of *Helcia sanguinolenta,* but it is now become very rare.

T. suavis.

Pseudo-bulbs ovoid, much compressed, almost discoid, the largest 3½ inches long and 2½ inches broad. Leaves elliptic-oblong, acute, the largest a foot long and 4 inches broad, the smallest less than one-third as large. Peduncles pendent, 2—5 flowered; bracts small, ovate, membraneous, striated. Flowers fragrant and the largest in the genus; sepals and petals lanceolate, acuminate, undulate, cream-white sometimes spotted with pale rose; lip broadly obcordate-cuneate with crisped and crenulate margin, obscurely three-lobed, the basal half white, convolute over the column into the form of a wide-mouthed funnel, the apical half spreading, more or less spotted and blotched with rose-pink, and with some orange spots and markings on the disk. Column terete with a fringed four-lobed hood.

Trichopilia suavis, Lindl. in Paxt. *Fl. Gard. I.* pp. 44, 53, t. 11 (1850). *Bot. Mag.* t. 4654. Van Houtte's *Fl. des Serres, VIII.* t. 761. Warner's *Sel. Orch. III.* t. 8. Rchb. Xen. Orch. II. p. 103. De Puydt, *Les Orch.* t. 44. *Belg. hort.* 1874, p. 89 (Lamarchei).



Trichopilia suavis.

sub-var.—*alba* (Williams' Orch. Alb. I. t. 14. *Lindenia, I.* t. 2), flowers wholly white except the yellow spot on the disk of the lip which is paler than in the spotted forms.

The origin of *Trichopilia suavis* appears to have been but vaguely known till the late M. Morren of Liége published the following particulars of its habitat in the *Belgique horticole* of 1874:—

> "It was discovered in 1848 by Warscewicz in Costa Rica, on the Cordillera, at an altitude of 5,000—8,000 feet. He met with the finest specimens on the volcano of Chiriqui, at an altitude of 8,000 feet, in a region where the thermometer ranged from 10°—15° C. (50°—60° F.). Warscewicz found the plants growing on oaks, and on *Cupania glabra* at from 20 to 40 feet above the ground, never lower down; if the trees to which they affix themselves are thrown down by any accident or fall from old age, the Trichopilias upon them languish and die. On Chiriqui at this altitude there is a dry season lasting from November till April, when there is neither rain nor dew and the wind is often very violent; but throughout the remainder of the year both rains and dews are copious and frequent."

Trichopilia suavis flowered for the first time in this country in 1851 simultaneously in the collections of Mrs. Lawrence at Ealing and Mr. R. S. Holford at Westonbirt and in the nursery of Messrs. Loddiges at Hackney.

T. tortilis.

Pseudo-bulbs clustered, ovoid, compressed, pale green, 1½—2½ inches long. Leaves elliptic-lanceolate, acute, 5—7 inches long. Peduncles procumbent, shorter than the leaves with an appressed sheathing bract at each joint. Sepals and petals linear-oblong, 2½ inches long, spirally twisted, dull pale rose with a broad margin of light yellow green; lip white blotched and spotted with light red-brown, broadly oblong when spread out, four-lobed, the basal lobes rolled over the column, the anterior lobes spreading with crisped and undulate margin. Column terete with a three-lobed fimbriated hood at the apex.

Trichopilia tortilis, Lindl. in *Bot. Reg. XXII.* t. 1863 (1836). *Bot. Mag.* t. 3739. Rchb. Xen. Orch. II. p. 101. Knowles and Westc. *Fl. Cab. III.* t. 101. Morren in Belg. hort. 1874, p. 91. Williams' *Orch. Alb. VIII.* t. 349.

Trichopilia tortilis is the species on which the genus was founded by Dr. Lindley in 1836; it had been introduced the year before by Mr. Barker, of Birmingham, and shortly afterwards it was sent by Mr. Parkinson, Her Majesty's Consul in Mexico, to the Woburn collection, where it flowered in 1839. Several localities in southern Mexico are recorded in which it was gathered by Ehrenberg, Galeotti and other botanical explorers of that region.

COCHLIODA.

Lindl. Fol. Orch. 1853. Benth. et Hook. Gen. Plant. III. p. 561 (1883).

Lindley founded the genus Cochlioda on a Peruvian species discovered by Matthews in 1838,* but which he did not publish till 1853. He had, however, previous to the last named date described another species that had been discovered by Hartweg as *Odontoglossum roseum*,† but which conforms to Matthews' type in all its essential characters. When, some years later, Reichenbach compiled a synopsis of the ORCHIDEÆ for Walper's *Annales Botanices* he referred one of the true Cochliodas (*C. sanguinea*) also *Ada aurantiaca* and one or two more species to his own genus Mesospinidium which he had proposed some time before for a small-flowered, paniculate Odontoglossum. To these he subsequently added Lindley's *Odontoglossum roseum* and another Peruvian species here described as *Cochlioda vulcanica;* hence it happened that three of the four species described in the following pages became known in gardens under genera to which they did not belong.

Cochlioda as defined by Mr. Bentham in the *Genera Plantarum* is a very natural genus including about half a dozen species, all inhabiting the Andes of northern Peru and Ecuador at a considerable altitude. The essential characters of the genus are seen chiefly in the labellum which is adnate to the column, in two or three species almost to its apex, whence the Cochliodas have been likened to an Epidendrum with the habit of an Odontoglossum, the pollinary apparatus too being almost like that of the latter genus. The species are also distinguished by their bright rose or rose-scarlet flowers which render them very ornamental in contrast with the white, yellow and brown of the allied genera Odontoglossum and Oncidium.

Cultural Note.—As the Cochliodas occur on the Andes of South America at 5,000—10,000 feet elevation they live under the same or nearly the same climatic conditions as the Odontoglots indigenous to the same vertical range; their cultural treatment should therefore be the same as that for Odontoglossum which is fully detailed under that genus.

Cochlioda Noezliana.

Pseudo-bulbs ovoid-oblong, much compressed, 1½—2 inches long, mono diphyllous. Leaves linear-oblong, acute, 4—6 inches long. Peduncles nodding, or pendulous, nearly as long again as the leaves, racemose, sometimes paniculate, many-flowered. Flowers about an inch in diameter, orange-scarlet, the disk of the lip yellow; dorsal sepal and petals oval-oblong, acute, the lateral sepals similar but narrower and longer; lip three-lobed, the lateral lobes oblong, obtuse, the intermediate lobe bluntly obcordate; crest consisting of four short tooth-like plates, bright yellow. Column triquetral, darker in colour than the other parts of the flower.

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* *Cochlioda densiflora*, not in cultivation.

† In Bentham's Plant. Hartweg, p. 151 (1844).

Cochlioda Noezliana, Rolfe in *Lindenia*, *V.* t. 266 (1891). Odontoglossum Noezlianum, Hort. Linden.

A very handsome species introduced in 1891 by Messrs. Linden, L'Horticulture Internationale of Brussels, from South America through its discoverer, M. John Noezli. It was also introduced into British gardens about the same time by Messrs. Charlesworth, Shuttleworth and Co., who inform us that their plants were collected in northern Peru, near the locality in which *Cochlioda vulcanica* is found.

C. rosea.

Pseudo-bulbs broadly ovate, much compressed, about 2 inches long, diphyllous. Leaves narrowly ligulate, acute, 6—8 inches long. Racemes as long as the leaves, elegantly curved; bracts awl-shaped, half as long as the pedicel and ovary. Flowers scarcely an inch in diameter; sepals and petals elliptic-oblong, acute, spreading, bright rose-carmine; lip as long as the petals, three-lobed, the lobes lighter in colour than the petals, the lateral two rounded, the intermediate longer, narrowly oblong, reflexed; crest consisting of four slightly divergent white rounded plates, of which the middle two are the longest. Column white, three-toothed at the apex.

Cochlioda rosea, Benth. in Journ. Linn. Soc. XVIII. p. 327 (1881). Odontoglossum roseum, Lindl. in Benth. Pl. Hartweg, p. 151 (1844). Id. Fol. Orch. Odont. No. 65. *Bot. Mag.* t. 6084. Batem. *Monogr. Odont.* t. 22. Rchb. in Walp. Ann. IV. p. 848. *Illus. hort.* XVIII. t. 66. Mesospinidium roseum, Rchb. in Gard. Chron. 1872, p. 392, sub. M. vulcanicum.

Discovered by Hartweg on the Peruvian Andes near Loxa during his exploration of the region in 1840—41 for the Horticultural Society of London, but not introduced till 1865, when plants were sent to M. Linden's horticultural establishment at Ghent by Gustav Wallis. It was shortly afterwards introduced by Messrs. Backhouse, of York, into British gardens, in which it is often met with under the name of *Odontoglossum roseum* to which genus it was originally referred by Lindley.

C. sanguinea.

Pseudo-bulbs oval-oblong, compressed, 1½—2 inches long, sometimes mottled with brown in transverse lines, diphyllous. Leaves linear, acute, 7—9 inches long. Peduncles drooping, 15—20 inches long, usually racemed but sometimes branched near the base; raceme or panicle lax, many-flowered. Flowers about an inch in diameter when spread out; sepals and petals oval-oblong, apiculate, rose-pink; the dorsal sepal concave, the lateral two longer, narrower and connate to beyond the middle; lip paler in colour than the other segments, clawed, the claw adnate to the column; the blade reflexed, ovate, acute, at the base of which are two raised triangular white plates that are adnate to the column behind. Column short, terete, white.

Cochlioda sanguinea, Benth. et Hook. Gen. Plant. III. p. 560 (1883). Mesospinidium sanguineum, Rchb. in Walp. Ann. VI. p. 858. *Bot. Mag.* t. 5627.

The late Professor Jameson, of Quito, originally discovered this species on the Ecuadorean Andes near that city, and in 1851 it was gathered by Warscewicz in the same locality. It does not appear to have been introduced into British gardens till 1866, in the autumn of which year a plant was exhibited at one of the Royal Horticultural Society's meetings by Messrs. Backhouse, of York, who had imported it from Ecuador.

Although scarcely so bright and so elegant as the other species here described, it is well worth a place in every collection of cool orchids.

C. vulcanica.

Pseudo-bulbs ovoid, compressed and ancipitous, 1½—2 inches long, diphyllous. Leaves linear-ligulate, sub-acute, 4—6 inches long. Peduncles sub-erect, as long again as the leaves, racemed from below the middle, 10—15 or more flowered; bracts ovate-lanceolate, half as long as the ovary. Flowers about 1½ inch across vertically, bright rose-carmine except the crest on the lip and the anther which are white; dorsal sepal and petals narrowly oval-oblong, acute, the lateral sepals longer and narrower; lip three-lobed, the lateral lobes rotund, the intermediate lobe obcordate, emarginate, denticulate; crest consisting of four short ridges. Column terete above.

Cochlioda vulcanica, Benth. et Hook. Gen. Plant. III. p. 560 (1883). Mesospinidium vulcanicum, Rchb. in Gard. Chron. 1872, p. 393. *Bot. Mag.* t. 6001. *Lindenia, IV.* t. 154.

A very handsome species discovered many years ago by Dr. Spruce, the German botanist, who explored parts of northern Brazil and Ecuador. He detected it in the last named country on the volcanic mountain of Tunguragua, at an elevation of 10,000—11,000 feet growing among the erupted *scoriæ* from the crater, a circumstance which suggested the specific name. It was first introduced into British gardens about the year 1872.

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The names in italics are varieties or synonyms; those followed by × *are hybrids or supposed hybrids.*

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JAMES VEITCH & SONS,
ROYAL EXOTIC NURSERY, 544, KING'S ROAD, CHELSEA, S.W.

H. M. POLLETT & Co ,
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Vol II.

A MANUAL

OF

ORCHIDACEOUS PLANTS

CULTIVATED UNDER GLASS IN GREAT BRITAIN.

PART I.

ODONTOGLOSSUM.

JAMES VEITCH & SONS,
Royal Exotic Nursery, 544, King's Road, Chelsea, S.W.

1887.

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PRELIMINARY NOTICE.

THIS Manual is being compiled to supply amateurs and cultivators of exotic Orchids with a fuller account of the principal genera, species and varieties cultivated under glass than is contained in the Manuals hitherto in use.

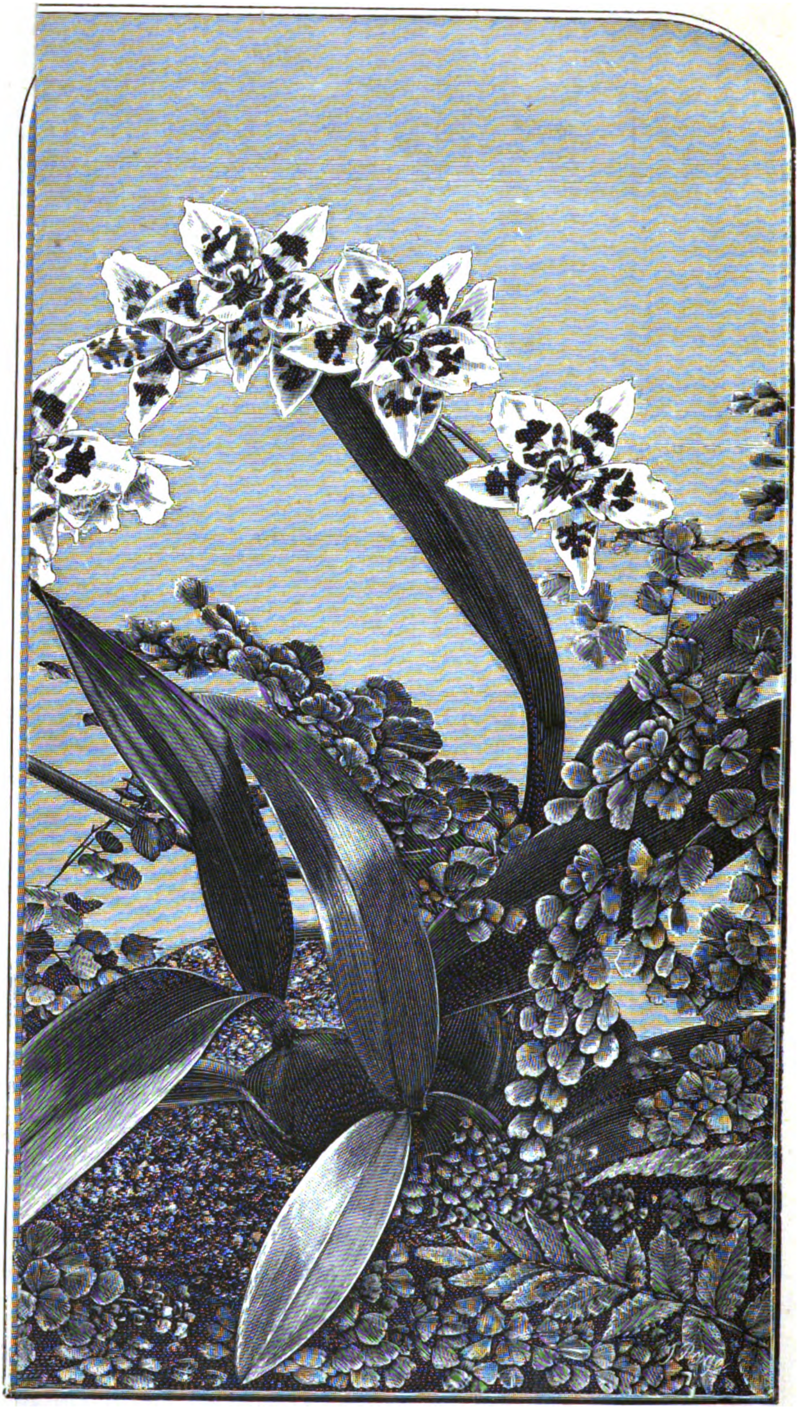
The rapid extension of Orchid culture during the last quarter of a century, resulting from the increased taste for and appreciation of this beautiful and interesting order of plants, has, in our opinion, created the *desideratum* which we are now attempting to supply. The prominent place, too, occupied by Orchids in the columns of the Horticultural Press, and the surprising amount of practical and varied information respecting them disseminated through its agency, has also stimulated the desire to obtain all the leading facts in a condensed form, to which easy reference may at any time be made.

So numerous are the species and varieties of Orchids at present in cultivation, and to which additions are constantly being made by new discoveries and by artificial hybridisation, that the labour attending the compilation of a Manual sufficiently comprehensive to meet the wants of cultivators must necessarily demand much time. Moreover, the present unsatisfactory state of Orchidology, especially in its horticultural aspect and its complicated and unscientific nomenclature, have rendered the compilation of such a Manual within a stated time almost an impossibility.

Under these circumstances, and yielding to the solicitations of patrons and friends, we have decided upon issuing the work in parts, each part containing a monograph of the cultivated species and varieties of one of the most important genera, or of a group of genera.

Little explanation of the plan of the work is here needed; the parts as issued must speak for themselves. We have only to state that in the scientific classification and sequence of the genera we have followed, with but trifling deviations, the arrangement of Bentham and Hooker as elaborated in their *Genera Plantarum*, the most profound and, at the same time, the most intelligible exposition of the Orchideæ extant. In the nomenclature of the species, we have adhered to the Laws of Botanical nomenclature adopted by the International Botanical Congress, held at Paris in August, 1867.

In the description of the species, we have been compelled to use occasionally a few technical terms to avoid cumbrous circumlocutions; at the conclusion of the work we propose giving a glossary of the terms so used. In the cultural notes we have quoted temperatures in the Centigrade scale with the equivalent Fahrenheit readings, in the hope that the far more rational scale, now almost universally adopted in scientific investigations, may also come into use in horticulture. The literary references in italics indicate coloured plates of the species or variety described.



:hroeder, at The Dell, near Staines.

et, Covent Garden.

ODONTOGLOSSUM.

Humboldt & Kunth, Nov. Gen. et Sp. I. 350, t. 85 (1815). Lindl. Fol. Orch. Odont. (1852). Benth. et Hook. Gen. Plant. III. p. 561 (1883).

Among "cool" Orchids, the palm of superiority is universally assigned to the Odontoglots, and many are the striking floral qualities they possess, which entitle them to that proud distinction; the beauty of the flowers, the elegant arching or pendulous racemes in which they are generally produced, the uninterrupted succession of bloom which is supplied throughout the year by the different species and races, the moderate size of the plants, and the comparative ease with which they may be successfully cultivated; all these circumstances combine to render them amongst the most popular of Orchids. Apart from their merits as horticultural plants, the Odontoglots are eminently deserving the attention of the orchidologist, for whom there is no genus in the great Orchidean family, that we know of, in which more abundant and varied materials may be found for studying the effects produced by cross fertilization in a natural state.

The essential characters of Odontoglossum are:—[*]

> The *sepals* are spreading and free, the lateral ones rarely united at their bases.
>
> The *petals* are generally of the same size as the sepals, but sometimes broader.
>
> The *lip* is parallel with the column at the base, and sometimes adnate to it; the intermediate lobe or limb is either spreading or deflexed, and is furnished with a fleshy crest near the base.
>
> The *column* is club-shaped, often elongated, usually narrow at the base, sometimes expanded into a membraneous wing on each side, or into auricles at the apex, or is wingless.
>
> The *pollinia* are two, pear-shaped or ovoid, united to an oval viscid disc or gland, by a linear or flattened caudicle.
>
> The *capsule* is variable in form, but usually ovoid or oblong, and often rostrate.[†]

---

[*] Abridged from Lindley, *Fol. Orch. Odontoglossum*, and Bentham and Hooker, *Genera Plantarum.*

[†] The seed capsules vary considerably, both in size and form, in the different species. Thus, in *Odontoglossum Rossii* and *Od. maculatum* they are greatly elongated, and have but a comparatively small diameter at their broadest part; in *Od. triumphans* the capsule is three-angled, with acute edges, much shorter than in the two first-named species, but with a greater diameter; in *Od. Pescatorei* it is prismatoid with the angles rounded off.

The above generic characters are constant and easily recognised in all the principal types described in the following pages, with a few minor deviations to be noticed in their respective places. The genus as above circumscribed may, on the whole, be considered a natural one, and little likely to be confounded with any other, although, as Mr. Bentham observes, "it is difficult technically to separate it from Oncidium*, and is occasionally thrown into confusion by the introduction of species which do not correspond to the generic characters." Of such are Lindley's *Odontoglossum roseum* and Reichenbach's *Od. vexillarium* and its allies. As to the species, or so-called species, there are, indeed, some well-defined types, around which a good many forms may be grouped, but many of the most distinct of these are connected by intermediate forms, which blend into each other by gradations so small that any sub-division of the genus, such as that proposed by Lindley, is extremely unsatisfactory, and horticulturally of no practical value, as the cultural requirements of the true Odontoglots, with few exceptions, are nearly identical.

In their vegetative as well as in their floral organs the Odontoglots have characters in common with Oncidium, into which the genus merges in one direction, and with Miltonia, with which it unites in another; hence the further difficulty of defining technically the limits of the genus. The vegetative organs of this group of Orchids are the same in all their essential characters, so that one description serves for the three genera. These organs are entirely adapted to the life of the plants as epiphytes.

> There is a *rhizome* strong in texture, well fitted to sustain the superincumbent parts of the plant on the trunks and branches of trees, and on the rocks on which they live. From the rhizome, usually from the part immediately beneath the pseudo-bulb, as well as from the base of the pseudo-bulb itself, tough stringy roots are emitted in all directions, creeping over the bark of the trees, or other supports upon which the plants grow, or among the decaying vegetable and other matter that finds a resting place there.
>
> The *pseudo-bulbs* are generally sessile on the rhizome, and in most of the species are so much crowded as to hide the rhizome from view; they are either pyriform, ovoid, ovoid-oblong or subglobose,

---

* Jour. Linn. Soc., XVIII. p. 327. Dr. Lindley expresses the same thing in an introductory note to his monograph of Odontoglossum in the *Folia Orchidacea*; indeed, it is palpable enough to everyone who studies Orchids in their scientific aspect.

always more or less flattened or compressed, with acute edges, and bear at their apex a solitary leaf, or more frequently a pair of leaves. Besides the apical leaves, there are always produced from the base of the pseudo-bulbs—from the bud from which the new pseudo-bulbs arise—four to six leaves, two to three on each side, distichously arranged, and imbricate at their bases, the uppermost pair being the largest, and at first entirely enclosing the young bulb, which gradually emerges from between them as it increases in size. These basal leaves are less persistent than the apical ones; one of their chief functions is evidently the protection of the young growth and flower scape, which always spring from the axil of the uppermost leaf on one side, but sometimes in strong plants from each side of the new pseudo-bulbs.

The *leaves* in nearly all the species are ensiform, linear-lanceolate or simply lanceolate, complicate (folded) at the base, and tapering to a more or less acute point; they have a midrib depressed on the upper side, and keeled beneath, and numerous longitudinal veins symmetrical with it on each side, in some species very plainly distinguishable, in others but faintly traced. In texture the leaves are usually sub-coriaceous, of a bright grass green colour above, and paler beneath. A few kinds, such as *Od. grande*, have leathery ovate-lanceolate leaves of a deeper green, and in nearly all the species the pseudo-bulbs and foliage acquire a purplish tinge on exposure to direct solar light.

The *inflorescence* consists of a scape, terminating either in a simple raceme or in a branched panicle. The flowers are borne on short pedicels, with boat-shaped, triangular or scaly, acute sheathing bracts at their base, and are placed alternately and distichously along the rachis, which frequently becomes zigzag towards the extremity. In nearly all the forms with a simple raceme, the flowers on one side are turned towards the spectator, and those on the other in the opposite direction, but on the branched rachides they are nearly all turned one way, that is, towards the light.

The genus Odontoglossum was founded by Humboldt and Kunth upon a species gathered in the beginning of the present century by the first-named traveller near Jaen, in northern Peru, and described in their *Nova Genera et Species Plantarum*, under the name of *Od. epidendroides*, a species that appears to be unknown to modern science, except from a fragment preserved in the Berlin Herbarium. Several allied forms have been since introduced, and some of them have been distributed under the name of *Od. epidendroides*,* but their identity with the type has, in every such case, been questionable. The name Odontoglossum is literally tooth-tongue, from ὀδοὺς ὀδόντος (odous, odontos), "a tooth," and γλῶσσα (glossa), "a tongue," in Orchid terminology "lip," in reference to the lip and its calli, which in most of the species are tooth-like projections near the base of the lip.

---

* Rchb. in Xen. Orch. I. p. 59.

The genus as at present circumscribed includes from 60 to 70 acknowledged species, many of which are exceedingly polymorphous, the deviations from the type[*] consisting chiefly in the size of the flower, the form of the floral segments, and in their colouration. Besides the recognised species, and owing to the intermixture of some of them in their habitats,[†] mule forms, whose number is indefinite, have appeared among the importations of the species from which they have evidently been derived. These hybrids are highly deserving of attentive study, for owing to the still very imperfect knowledge of the distributional limits of the species of Odontoglossum, and the still more imperfect knowledge we possess of the insect life of the region, it is at present hopeless to attempt any satisfactory explanation of their origin, or from the *data* already accumulated to deduce any general law respecting them. It is, however, curious to note, that notwithstanding the investigations of Darwin, Müller, and others[‡] had resulted in a very considerable modification of the belief in "the fixity of species," the first appearance of these hybrid Odontoglots was to many Orchidologists a surprise and a puzzle. They came to light slowly at first, one by one, and received distinguishing names chiefly at the hands of the Professor, whose authority was invoked for the purpose.[§] As the importations increased in frequency and quantity, the appearance of mule forms appeared in a like ratio, so that in the aggregate they now form a very numerous class; so numerous, indeed, are they that the giving of specific names to so complicated a series of hybrids has thrown the nomenclature of the Odontoglossums into a most bewildering confusion—a confusion aggravated by the reluctance of some writers, and still more so by irresponsible horticulturists, to recognise the polymorphy of the species, and to persist in giving specific names to forms that have no claim to that distinction.

---

[*] By the *type* is frequently implied the form that was first discovered, and afterwards preserved in herbaria, and with which other plants of the same species are compared. It is evident that in this sense the type, being more probably an accidental discovery than a selected form, may by no means be a good representative one of the species. We have used the term type in these pages more frequently in the broader sense of fairly representing the entire species or variety.

[†] Thus *Od. Lindleyanum* is found mixed with *Od. crispum*, *Od. Pescatorei*, *Od. luteo-purpureum*, and *Od. odoratum*; *Od. odoratum* with *Od. crispum* and *Od. luteo-purpureum*; *Od. triumphans* with *Od. Pescatorei* and *Od. crocidipterum*; *Od. Rossii* with *Od. maculatum* and *Od. nebulosum*, and several other instances.

[‡] And not less so, the remarkable definition of species by the great French naturalist, Lamarck (1744-1829), quoted by Professor Duncan in his address to the Linnæan Society of London at the anniversary meeting in 1884, and which we here reproduce. "A collection of similar individuals which were produced by other and similar individuals constitute species. This definition is exact, for every living creature *nearly* resembles those which produce it. That the species is constant, is not true; it is not distinguishable by invariable characters. Species only have a constancy relational to the duration of the circumstances under which the individuals have lived."

[§] Reichenbach, who does not, however, appear to lay much stress on these names from a scientific point of view, for he says:—"Für den Gartengebrauch habe ich ihnen kurze Namen gegeben, da wir nun einmal, so lange wir mit dem Publicum der Gartenwelt arbeiten, auf seine Anschauungen eingehen müssen."—*Xen. Orch. II.* p. 151.

The following facts are suggestive:—From the first it has been observed of these natural hybrids, that it is an extremely rare occurrence for any two appearing in different importations to be identical, although apparently derived from the same two species, and sometimes even sufficiently like each other to come under the same name. Nor ought this to be wondered at; the agency by which these hybrids and polymorphisms have been produced, has been in operation for ages past, and it cannot but have happened that a large number of these forms, both of those that are known, and of those hereafter to be brought to light, are not the immediate offspring of two recognised species or more primitive types, but are descended from their mixed progeny, further complicated by an occasional cross with one or other of themselves. Hence we already possess a number of forms that are "confluent in series," of which the two extremes are too widely separated for the interval to be covered by one, two, or even more intermediate forms.

As an illustration of this, we may adduce the *odorato-crispum* * group, of which *Od. Andersonianum* is a well-known form. When this Odontoglot first appeared in 1867, it was seen to be distinct from either of its supposed parents, although in general aspect and structure approaching *Od. crispum* much nearer than *Od. odoratum.* With the ever-increasing importations of the two species, new but similar hybrid forms constantly appeared, no one, perhaps, identical with the original *Od. Andersonianum*, but many sufficiently like it to come under the same name, now and then one of them receiving a modifying varietal name to indicate some minor differential character. So varied have these forms become, that the interval which separates a typical *Od. crispum* from the original *Od. Andersonianum* is now bridged over by a series of forms that shade off, in one direction into the species, and in the other into the supposed hybrid in its most distinct type. And not only so, but the various forms known as *Ruckerianum*, *Jenningsianum*, *limbatum*, &c., are now all so intimately connected by intermediate links, that it has become impossible to say where the partition-wall is to be set up between them.

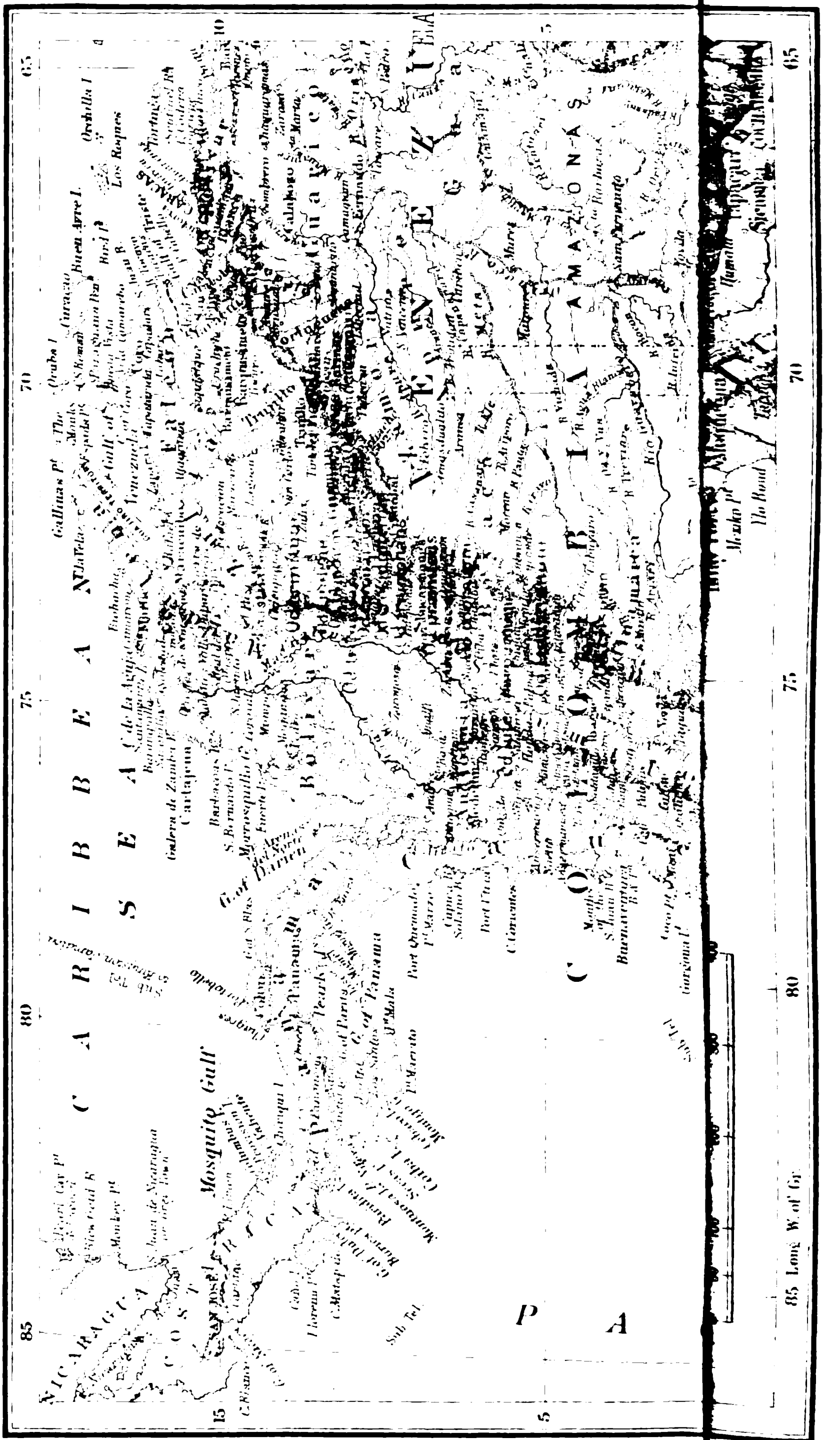
---

* We, of course, use this and similar terms as assumptions only, it being impossible to know which way the cross was effected.

And so with the forms derived from the supposed opposite or *crispo-odoratum* cross, a group that approaches more nearly *Od. odoratum* than *Od. crispum* in the general aspect and structure of the flowers. Certain of these forms, when they first appeared, received the names of *baphicanthum*, *hebraicum*, *deltoglossum*, *latimaculatum*, &c., but these are all now more or less intimately connected by a number of intermediate links that have since appeared, and which shade off into one or other of the named forms, and present a series in which the floral segments go on gradually enlarging, till the narrow forms of the *Andersonianum* group are very nearly approached, although the spotting and colouration of the segments are generally very different. A like gradation in change of form is also observable in the calli of the lip and the wings and cirri of the column; at first differing but slightly from those of the one supposed parent, these organs are seen to undergo change in form till they are well-nigh intermediate between those of the two.

As a further illustration, but a most important one, on account of its greater complexity, we cite the *odorato-luteopurpureum* group, of which the form known as *Mulus* was the first to appear, and which, although intermediate, has altogether the habit and aspect of *Od. luteo-purpureum*. *Mulus* was succeeded by other forms named *Hinnus*, *cuspidatum*, *Sceptrum*, *facetum*, *Vuylstekeanum*, &c., and these, together with recognised polymorphisms known in gardens as *hystrix*, *radiatum*, *lyroglossum*, are all more or less connected by other forms in cultivation, the whole forming a series so confluent as to leave no doubt whatever from which of the supposed parents the predominating characters have been derived.

It is unnecessary to adduce further instances, although it would be easy to do so. Enough is stated to make it clear that there are among the Odontoglots a number of natural hybrids or polymorphisms, probably of both, that have been derived from more primitive types, or in common parlance, "species," which they more or less resemble, and with which the most divergent forms are connected by intermediate links that form in a few cases a confluent series. In dealing, therefore, with Odontoglossum nomenclature, it appears to us that the simplest course to follow is to bring all such forms under the species they most nearly approach. This plan is by no means free from objection, but it has at least the advantage of grouping together a number of allied forms, which, if described under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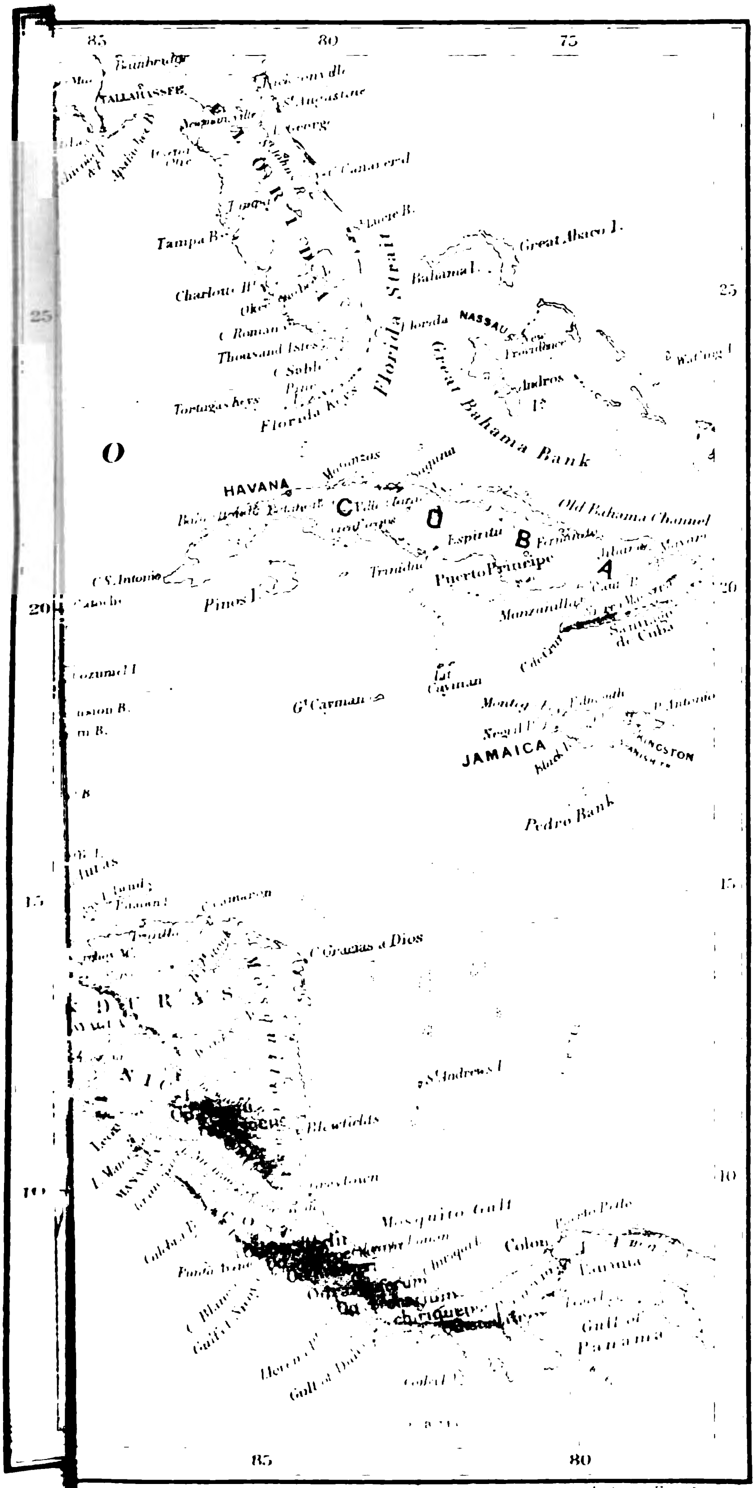
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Gt Carman
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Pedro Bank
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C. Gracias a Dios
St Andrews I.
Bluefields
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Mosquito Gulf
Colon
Porto Bello
Panama
Gulf of Panama
85
80

separate names, would leave the acknowledged confusion much where it was.*

We have only to add that other forms of supposed hybrid origin, known at present only as single specimens, or limited to two or three closely resembling forms, although in some instances near one of the supposed parents, are not yet connected with it by a sufficient number of intermediate links to allow of their being brought under it as varieties. These must, therefore, bear the independent names that have been given to them, at least, till the interval separating them from their supposed parents shall have been bridged over by future discoveries and introductions.

Geographical distribution. The Odontoglots are confined to the mountain region of tropical America that extends from about lat. 15° S. to lat. 20° N. They are also restricted to particular mountain chains within these limits, so that while spreading to an immense distance in one direction, they are included within a comparatively narrow space in the other. Their southern limit is where the great Cordilleras of the Andes begin to draw closer together after enclosing the lofty plateau of Peru and Bolivia, and where a change in the climatal conditions of the Andean region becomes perceptible. The most southern Odontoglot at present known is *Od. compactum* (Rchb. in Gard. Chron. III. 1875, p. 492), which occurs on a lofty ridge near Cuzco, called Las Tres Cruzes. From Cuzco northwards as far as Chachapojas, a distance of over 500 miles, the Odontoglots occur very sparingly, only three or four small-flowered species having yet been found, but at the last-named place they begin to appear at much smaller intervals. *Od. myanthum* (Lindl.), *Od. gracile* (Lindl.), and some other small-flowered species are reported from Loxa (Loja), and still nearer the equator, the magnificent *Od. Halli,* the beautiful *Od. cirrosum,* and *Od. Edwardi* have their homes. North of the equator, the Andes break into three distinct ranges; one, the eastern Cordillera, running in a north-easterly direction, bends along the coast of Venezuela as far as Cape Paria. It is on this range that the greater part of the most popular kinds occur, being most numerous and most abundant on that portion of it that lies between Bogota and Ocaña, and which may thence be regarded as an Odontoglossum "centre." The middle range, called the central Cordillera, extends northwards, and terminates at Cape Gallinas; only a few species inhabit this range,* but the valleys on both sides, that of the Magdalena on the east, and the Cauca on the west are exceptionally rich in orchidaceous plants. The third range, or western Cordillera, has its trend near the Pacific coast, continues its course through the isthmus of Panama, and onwards to the high table-land of Mexico. No Odontoglots are reported from this range within the New Granadian territory, nor from the isthmus itself, where the lowest summit level between the oceans on each side of it is probably not greater than 150 feet; † but northwards of this the land again rises, forming at places peaks of great altitude, and here the Odontoglots again appear, the first to occur being *Od. chiriquense* ‡ and *Od. cariniferum,* both discovered by Warscewicz in the neighbourhood of Veragua. The delicate *Od. Krameri* and *Od. Oerstedii* have their home in Costa Rica, as also the more robust *Od. Schlieperianum;* and on the authority of the late Mr. G. Ure Skinner, the genus is represented in Nicaragua by a species named by Dr. Lindley *Od. rubescens,*§ but now referred by Reichenbach to *Od. Rossii.* Throughout Central America there extends a series of table-lands, which gradually increase in elevation as the distance between the seas increases, till the great wedge-like plateau of Mexico is reached, the average elevation of which is not less than 7,000 to 8,000 feet. On these elevated lands the Odontoglots at first occur sparingly, but gradually increase in numbers on advancing northwards towards Oaxaca, where they appear to attain their greatest northern development, beyond which they again diminish in numbers till their northern limit is reached at about the 20th parallel. Not far from this line is the southern limit of the Sierra Madre, where *Od. maxillare* has its home, and eastwards from this is the Irapean range, on which *Od. maculatum* and *Od. Cervantesii* were discovered nearly a century ago by the veteran orchidologist, Lexarza; these are the most northern Odontoglots known.

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* This course is not without precedent. *Cypripedium Stonei platytænium* is recognised as a natural hybrid between *C. Stonei* and *C. superbiens,* but so much more resembles the first than the last that the propriety of regarding it as a variety of *C. Stonei* has never been challenged. With respect to Odontoglots, Reichenbach remarks, under *Od. macrospilum,* described by him in the Gardeners' Chronicle XXIV. (1885), p. 70: "Some Orchidists are of opinion that I regard all those doubtful plants as hybrids, but we know just nothing about it, and I quite agree with those who think them partly varieties."

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* Chiefly between Quindiu and Medellin.

† Physical Geography by Keith Johnston.

‡ Rchb., but now known to be a local form of *Od. coronarium.*

§ Fol. Orch. Od. No. 27. See Gard. Chron. XI. (1879), p. 138.

Not only are the Odontoglots confined to the mountain chains and table lands above described, but they are also restricted, with few exceptions, to a zone whose vertical range is comprised within comparatively narrow limits. On the South American Continent, from the southern limits of the genus to as far as the isthmus, by far the greatest number of the Odontoglots occur within a zone whose vertical range rarely descends below 5,000 ft., or ascends above 9,000 ft. There are some species, indeed, such as *Od. densiflorum* (Lindl.), *Od. compactum* (Rchb), and a few other small-flowered species which grow on rocks, or on the bare ground above the timber line to as high as 11,000 to 12,000 ft. elevation.

The climate of this zone, by reason of its elevation, is decidedly temperate, the mean annual temperature being about 14° C. (57° F.) for the higher portion, and 18° C. (65° F.) for the lower, but the difference between the maximum and minimum temperatures observed during the year is very great, the thermometer sometimes standing at 32° C. (90° F.), and even higher when the sun is vertical, and descending to 4° C. (40° F.) in the night. The atmosphere of this elevated region is always at a very high degree of saturation, caused chiefly by the north-east trade wind, by which the enormous evaporation from the Atlantic Ocean is constantly being drifted towards the Cordilleras, where it is arrested and condensed; the rainy season of parts of the Odontoglossum region is thus almost continuous throughout the year.* At night, when the temperature falls considerably below the mean, the vapour with which the atmosphere is always charged takes the form of a dense fog, which always leaves a copious deposit of dew before being dispersed by the rising day temperature.

As a consequence of these climatic conditions, the vegetation of the region is uninterrupted throughout the year; the whole belt is covered with a dense forest with occasional openings, of which the chief ingredients in Ecuador and Southern New Granada are trees belonging to the Cinchonaceæ, partially succeeded further north by species of Juglans and an evergreen oak (*Quercus tolimensis*).† The Odontoglots are found in the greatest abundance in those parts of the forest which skirt the occasional openings, and along the margins of the numerous mountain streams, where there is freer access of light and air, and when it not infrequently happens that numbers of plants are found fully exposed to the direct rays of the sun. It is observed of these that their pseudo-bulbs are always smaller than those which are partially shaded; they also flower more freely, but the spikes are neither so long, nor the flowers so large as those produced by plants in partially shaded situations; while those growing in more complete shade—on fallen trees, or on the ground where there is always an excess of moisture—have large fleshy pseudo-bulbs, rarely flower, suffer much by removal, and generally die during transmission to Europe.*

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* At Bogota there are two wet and two dry seasons in one year, the first wet season lasting from March to May, and the second from September to December; but even during the so-called dry seasons it is said that there are few days on which rain does not fall. December is the coldest month; average mean, 14° C. (57° F.), and February the warmest, 16° C. (61° F.).

† Grisebach. Veg. der Erde, Vol. II. p. 435.

North of the isthmus, and especially within the Mexican territory, the local circumstances are somewhat different from those of New Granada, caused chiefly by the peculiar configuration of the land. Here the Odontoglots appear to be spread generally over those portions of the plateau wherever the conditions suitable to their well-being exist, as well as on the slopes of the central mountain ranges and the various spurs that branch from them. The climatic conditions of the Odontoglossum region north of the Isthmus of Panama are also somewhat different from those of the Odontoglossum region of New Granada and Venezuela. Thus, in Guatemala there is a wet and a dry season, the first commencing in December and ending in April, and the second lasting through the remainder of the year; there is thus a decidedly pronounced rest in the vegetation of the country,† but on the higher grounds, where the Odontoglots have their home, there is always a high degree of saturation in the atmosphere, even in the dry season, caused by the moisture from the Atlantic and the lowlands being drifted thither by the trade wind, and which during the nights in the early part of the year, takes the form of dense fogs. In Mexico the climatic conditions of the *Tierra fria* are similar to those of the highlands of Guatemala, but the rainy season is of shorter duration; the temperature is remarkably uniform, the mean summer and winter temperature varying scarcely more than 6°—7° C. (10°—12° F.). The precipitation caused by the trade wind attains its greatest strength on the eastern slopes of the mountains skirting the high central tableland; here the rainy season lasts eight months of the year, and the temperature ranges between 12°—15° C. (53°—60° F.).

Throughout the whole of the Odontoglossum region, there is never a perfect rest in the aerial currents; there is always a gentle breeze to be noted.‡

Cultural Note.—The most essential points in the cultural treatment of Odontoglots are readily deducible from the climatic conditions of their habitat sketched above; they are, briefly stated, referable chiefly to four heads, viz., temperature, moisture, air, and light. The regulation of these, so far as they are within the control of the cultivator, must, in a great measure, depend upon the circumstances of our own climate as they occur through the successive seasons of the year. The form of the house in which Odontoglots are cultivated, is of little moment, provided it be such as to admit of the essentials being regulated with the greatest efficiency; we give, however, a decided preference to a span-roofed house, built in a north and south direction—or, as it would be expressed on the Continent, with an east and west orientation—because, during the sun's daily course, both sides of the house are exposed alternately and equally to his direct rays, and it also admits of the shading apparatus being manipulated with greater efficiency. With these preliminary remarks we may now summarise the routine of culture:—

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* Kalbreyer, in lit.

† F. C. Lehmann in Gard. Chron. XX. (1883), p. 24.

‡ Idem.

1. *Potting.*—The pots should be proportionate to the size of the plants, that is to say, only just so large as to admit of all the pseudo-bulbs being placed within, and at the same time well elevated above the rim. The potting material should consist of sphagnum moss and fibrous peat in about equal proportions; to these should be added a small quantity of sand or charcoal, or even some crocks broken up into small pieces, the whole well mixed together. The pots should be filled to two-thirds of their depth with clean broken crocks for drainage, and the remaining third with the potting compost. It is manifest from a consideration of the circumstances under which the Odontoglots grow in their native country, that the amount of vegetable matter within the reach of their roots is extremely limited; any attempt, therefore, to stimulate their growth by placing the plants in pots of a greater diameter than is sufficient to hold them, for the purpose of introducing more potting material, will result in failure, as experience has long since proved; indeed, over-potting cannot be too strongly cautioned against. The usual time for potting is the month of September, except for those plants then in flower, because at that season a moist atmosphere in the house can be maintained without difficulty, and there is little chance of the temperature falling below the prescribed limit even without fire heat. Plants not potted in September may be deferred to the end of February, or the beginning of March, or when there is least danger of interrupting their vegetation. Under all circumstances, the re-potting should be done annually to encourage the new roots, and because the constant waterings wash away and exhaust the old compost.

2. *Temperature.* This should range throughout the year between 8° and 20° C. (45° to 70° F.), the lowest temperatures, of course, being during the winter months, the minimum allowed to be reached only in the severest weather, and, conversely, the highest temperature in the summer months, the maximum being reached only in very hot weather, when it is found difficult, or even impossible to keep it lower. The night temperature may range throughout the year from 2° to 5° C. (5° to 10° F.) lower than the day temperatures. It is always advisable that, on account of its drying action, no more fire heat should be used than is absolutely necessary to prevent the temperature at any time falling below 8° C. (45° F.). It should

always be turned off at night, even in severe weather, if the precaution be taken beforehand to raise the temperature sufficiently to prevent its falling below the minimum after being turned off, and in the interval before being turned on again in the morning. This is much safer than allowing the Odontoglossum house to be warmed by fire heat during the night, which, unless watched, might cause the temperature to rise so considerably, that the reading at midnight might be higher than at mid-day.

3. *Watering.* The amount of water and the frequency with which it should be applied direct to the plants, must be regulated according to the time of the year. In the winter months, the plants should be looked over every alternate day, and water given according to their necessities; it is most important that the potting material should at no time be allowed to get quite dry. The house should be damped down* every morning, or at least so often as is sufficient to maintain a moderately saturated atmosphere.† As the season advances, the waterings must become more frequent, and the damping down must be done both morning and evening, while in the hottest months it may be found necessary to damp down the houses three or four times a day, in order to keep the atmosphere near the saturation point. The temperature of the water applied direct to the plants should not be lower than the night temperature of the house.

4. *Ventilation.* This, like the watering, must be regulated according to the season of the year, and the temperature of the external air; thus, when the external air is 5° C. (40° F.), a little air should be admitted, when at 7° C. (45° F), more air may safely be allowed ingress; when at 10° C. (50° F.), where a system of upper and lower ventilators are in use, the lower ones should be wide open, and the upper ones partially so, provided sudden draughts are avoided; and when at 15° C. (60° F.), as much air should be admitted as possible. Even full exposure to the external atmosphere, provided it be not too dry, is at 15° C. (60° F.) and a few degrees higher, a source of robust health to the plants.

5. *Shading.* The shading material to be selected must be determined by the position of the house. For a span-roofed house with an east and west orientation, or a lean-to with any other aspect than a northern one, the shading, known as Brittain's Netting, No. 6, is

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* A gardening phrase for watering the side walls, pathways, or any other surface within the house from which water freely evaporates.

† This applies to houses in which the stages are constructed of battens, slates, or of any material which allows water resting on it to evaporate freely. In the case of stages formed of earth and ashes, as in some of our own houses, a sufficiently moist atmosphere is maintained by the watering of the plants standing on them; the damping down is here unnecessary, and even injurious in cold damp weather. In houses built in dry situations rock-work planted with Ferns and other suitable subjects is a good aid to the retention of a moist atmosphere and an equable temperature; it also improves the general effect of the house.

one of the best that can be selected. The best shading arrangement in these cases is an outside roller blind, raised 6 inches above the glass by means of strips of wood running parallel with the rafters, and upon which the blinds can roll; this arrangement permits a current of air to pass between the blind and the glass. Houses thus shaded and carefully ventilated, will, during the summer days, contain an atmosphere several degrees lower than the external air. In every case the shading need only be used where the sun is powerful enough to raise the inside temperature above 15° C. (60° F.).

Odontoglots have enemies in insects, slugs, &c., which must be kept under as soon as detected. Thrip, particularly the small white kind that appears in dry warm weather, should be especially guarded against. We have always found "flowers" of sulphur the best remedy against this pest; a pinch dropped into the young growth kills the insect without having any injurious effect on the plant. There can be no doubt, however, that the presence of the thrip indicates an impure atmosphere in the house; hence a constant attention to the ventilation cannot be too strongly insisted upon.

SYNOPSIS OF SPECIES AND VARIETIES.

Odontoglossum bictonense.

Pseudo-bulbs ovoid, compressed, angulate, diphyllous. Leaves lanceolate, acute, 12 inches long, distinctly nerved. Scapes erect, racemose, rarely paniculate, many-flowered Flowers 1½—2 inches in diameter, variable in colour. Sepals and petals similar, linear lanceolate, usually yellow-green blotched with chestnut-brown; lip cordate, acuminate, waved at the margin, pale rose colour; crest bilamellate. Column winged.

Odontoglossum bictonense, Lindl. *Bot. Reg.* 1846, t. 66. Id. Fol. Orch. Od. No. 28 (1852). Van Houtte's *Fl. des Serres XV.* t. 1502 (1862). *Illus. hort.* 1865, t. 449. *Id.* 1872 t. 91 (album); Batem. *Monogr. Od.* t. 18 (1874).* Cyrtochilum bictonense, Id. *Orch. Mex. et Guat.* t. 6. Zygopetalum africanum, *Bot. Mag.* t. 3812.

Sub-varieties, distinguished by colour only. Three distinct types can be selected—*album*, sepals and petals reddish brown, lip white; *roseum*, sepals and petals brown, lip deep rose; *sulphureum*, sepals and petals yellow, lip white.

Od. bictonense is interesting as being the first Odontoglot that ever reached England alive.† It was discovered by Mr. G. Ure Skinner in Guatemala, and sent by that gentleman to Mr. Bateman, at Knypersley, in Cheshire, in 1835; it was also communicated at the same time to Lord Rolle, in whose collection at Bicton—whence the name—it flowered for the first time in this country in the following year. It was subsequently discovered by Ghiesbreght, a

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* The inflorescence represented in this plate is evidently abnormal.

† Bateman Monogr. sub. t. 18.

Belgian traveller in Mexico, who sent plants to the horticultural establishment of M. Verschaffelt in Ghent, in 1864.* *Od. bictonense* usually flowers from September to November.

Od. blandum.

A dwarf species. Pseudo-bulbs not much larger than a walnut, elliptic compressed, diphyllous. Leaves linear-lanceolate, 6—10 inches long. Flowers rather crowded in a nodding raceme about as long as the leaves; sepals and petals similar, lanceolate, tapering to a sharp point, white spotted with reddish purple; lip with an ovate, apiculate blade, wavy, dentate, white, with one or two large spots in front of the calli, and some smaller ones scattered over the remaining area; calli consisting of two nearly parallel bright yellow lamellæ, which terminate in front in two erect narrow teeth. Column with three or four cirri on each side near the apex.

Odontoglossum blandum, Rchb. in Gard. Chron. 1870, p. 1342. Batem. *Monogr. Od.* t. 28 (1874). Williams, *Orch. Alb. V.* t. 222 (1886).

This lovely Odontoglot has its home on the Alto de Camerone, an offshoot of the eastern Cordillera of New Granada, running parallel with the Magdalena, and near which is situate the town of Ocaña. It occurs at an elevation of 5,500 to 6,500 feet, growing chiefly on the moss-covered stems of Melastomaceous trees, which, owing to the moisture of the climate, are constantly wet, and where the plants flower all the year round. It was first discovered by Mr. Blunt, while collecting orchids in New Granada for Messrs. Low & Co. (1863—5), but whose plants perished during transmission to Europe; a similar fate befalling the consignments of M. Roezl and others, who afterwards collected it. Its earliest appearance in England in a living state was among a miscellaneous lot of orchids purchased at Mr. Stevens' Rooms, by the Royal Horticultural Society, in whose collection at Chiswick it flowered in 1871. It continued to be very scarce till Mr. Kalbreyer, by judicious packing and careful superintendence of the transport down the Magdalena, succeeded in 1879 in sending us a moderate importation of healthy living plants. It is, however, still a rare plant in British collections, and will, we fear, long continue so.†

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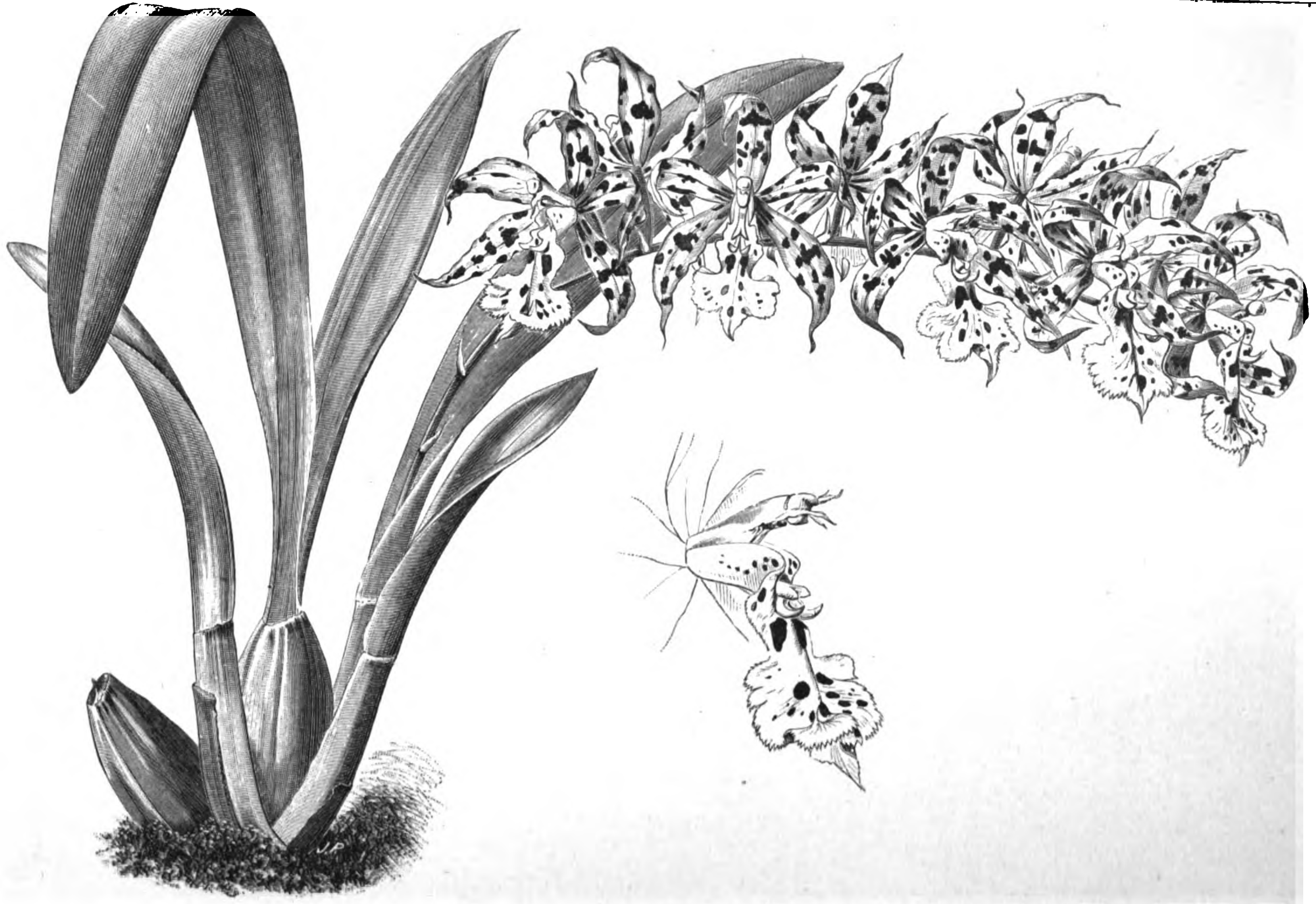
* Illus. hort. 1865, sub. t. 449.

† Probably no Odontoglossum is more difficult to import alive than *Od. blandum*, owing to its pseudo-bulbs always being immersed in moisture, and no other could be named of which the destruction in collecting and during transport has been relatively so great—so great, indeed, as to call forth the severe censure of Professor Reichenbach on the reckless manner in which this lovely Odontoglot has been torn by thousands from its native home and forwarded to Europe, only to arrive in a putrid mass. (See Gard. Chron., 1870, p. 1342.) Our correspondent, Mr. Kalbreyer, informs us that he believes it to be now almost extirpated on the Alto de Camerone.



Odontoglossum blandum.

A variety, represented by a single plant which occurred among the importation above mentioned, is worthy of especial notice; the spots on the sepals and petals are blackish purple, and much larger than in the typical plant; the blotch in front of the calli is chocolate-red, and the spots on the blade deep purple. This plant is now in the collection of F. A. Philbrick, Esq., Q.C., at Oldfield, Bickley.

Od. cariniferum.

Pseudo-bulbs oblong, smooth, compressed, 3—4 inches long, diphyllous. Leaves lorate, leathery, 10—15 inches long. Scapes robust, paniculate with zigzag branches. Flowers 2 inches across; sepals and petals lanceolate, acute, keeled at the back, olive-brown tipped and margined with yellow; lip with a long claw suddenly expanded into a reniform apiculate blade, white changing to yellowish brown before the flower withers; calli two rhomboid plates dentate along the upper edge, crimsonish mauve. Column winged, white stained with pale purple.

Odontoglossum cariniferum, Rchb. in Bot. Zeit. 1852, p. 638. Id. Gard. Chron. 1870, p. 560. Lindl. Fol. Orch. Od. No. 15 (1852). Batem. *Monogr. Od.* t. 10 (1874). Od. hastilabium fuscatum, *Bot. Mag.* t. 4919.

Discovered by Warscewicz in Chiriqui, Central America, in 1848, and by him sent to Germany, whence probably it reached England some years later. It continued to be very rare in British collections till 1870, when we received a small but healthy importation from Costa Rica, where it occurs in the forests on the mountain slopes facing the Pacific, growing on the tops of trees in company with *Od. Oerstedii* and *Od. Schlieperianum.* It usually flowers in October and November; it is also said to occur in Venezuela. The specific name *cariniferum,* "keel-bearing," refers to the keeled perianth segments.*

Od. Cervantesii.

Pseudo-bulbs about the size of a pigeon's egg, compressed, with acute edges, monophyllous. Leaves oblong acute, 4—6 inches long. Scapes longer than the leaves, clothed with sheathing bracts 3—6-flowered. Flowers 1½—2 inches in diameter; sepals and petals oval oblong, the petals much broader than the sepals, white with chocolate-red tangential streaks around the base; lip 3-lobed, lateral ones small, terminal one broadly cordate with erose margin, white, but sometimes with a transverse purple bar in front of the crest, which is two-lobed, hairy, with a bifid tubercle between the lobes. Column white, with an oblong spreading wing on each side.

Odontoglossum Cervantesii, Lex. Orch. Opusc. 37 (1825). Lindl. *Bot. Reg.* 1845, t. 36. Id. Fol. Orch. Od. No. 25. Id. Paxt. *Mag. bot*, *XII.* (1846), p. 193. Id. *Paxton's Fl. Gard. I.* t. 15, 1850-1. *Illus. hort.* 1854, t. 12. Williams' *Orch. Alb.* IV. t. 167. Od. membranaceum, Lindl. Sert. Orch. sub. t. 25 (1838). Id. *Bot. Reg.* 1846, t. 34. *Bot. Mag.* t. 4923. Linden's *Pesc.* t. 5.

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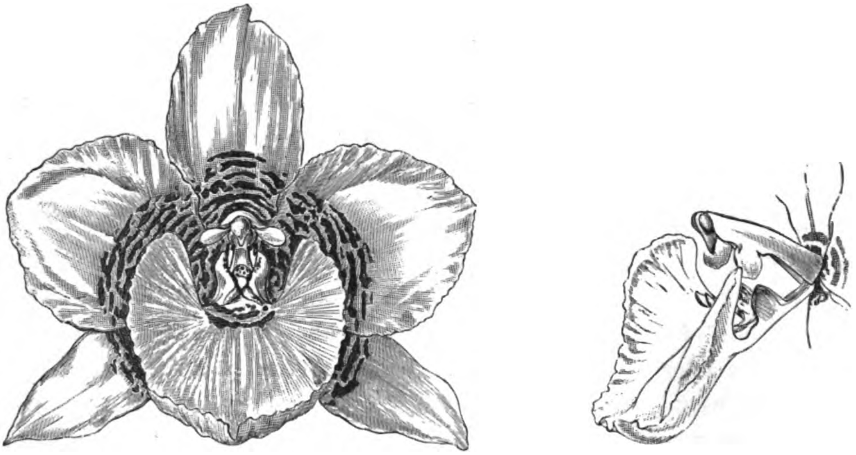
* *Od. cordatum, Od. hastilabium, Od. pardinum,* &c, also have keeled segments.

var.—decorum.

Flowers larger, with all the segments broader, especially the lip, which is also deeper lobed; the streaks shorter, broader, and covering a larger area; they are also purple, not red.

Od. Cervantesii decorum, Rchb. MS., and in Gard. Chron., IX. (1878), p. 527. *Fl. Mag.* n. s. t. 254 (1877). Williams' *Orch. Alb. VI.* t. 251.

Sub-vars.—*punctatissimum*, the segments spotted all over; *roseum*, the flowers pale rose.



Odontoglossum Cervantesii.

Od. Cervantesii has been known to science since the beginning of the present century; its first discoverers were the Spanish botanists La Llave and Lexarza, the latter of whom described it in his *Orchidianum Opusculum*, dedicating it to Vincentio Cervantes, a Mexican professor of botany.* It was introduced to British gardens from Oaxaca, in Mexico, by Messrs. Loddiges, of Hackney, in 1847; the variety *decorum*, which is in cultivation in the collection of Sir Trevor Lawrence, Bart., at Burford Lodge, and in one or two other places, is a comparatively recent introduction. *Od. Cervantesii* is spread over a considerable extent of country from the Irapean mountains southwards into Guatemala.

Cultural Note.—Although *Od. Cervantesii* succeeds well under the treatment recommended for all cool Odontoglots, it is advisable, whether grown in pans or pots, to suspend it near the roof glass of the house, where it can receive the maximum of light. In the case of this, as of

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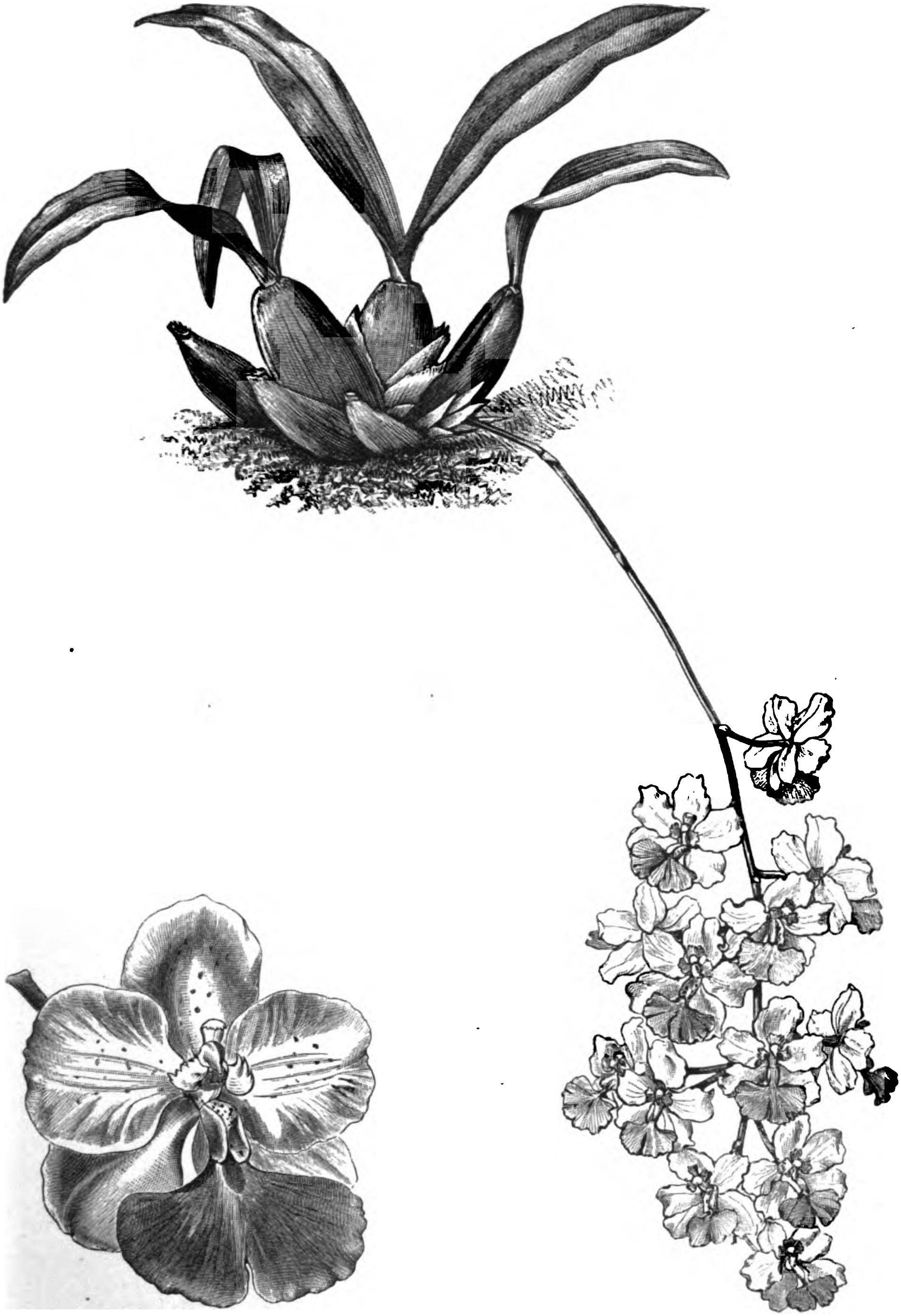
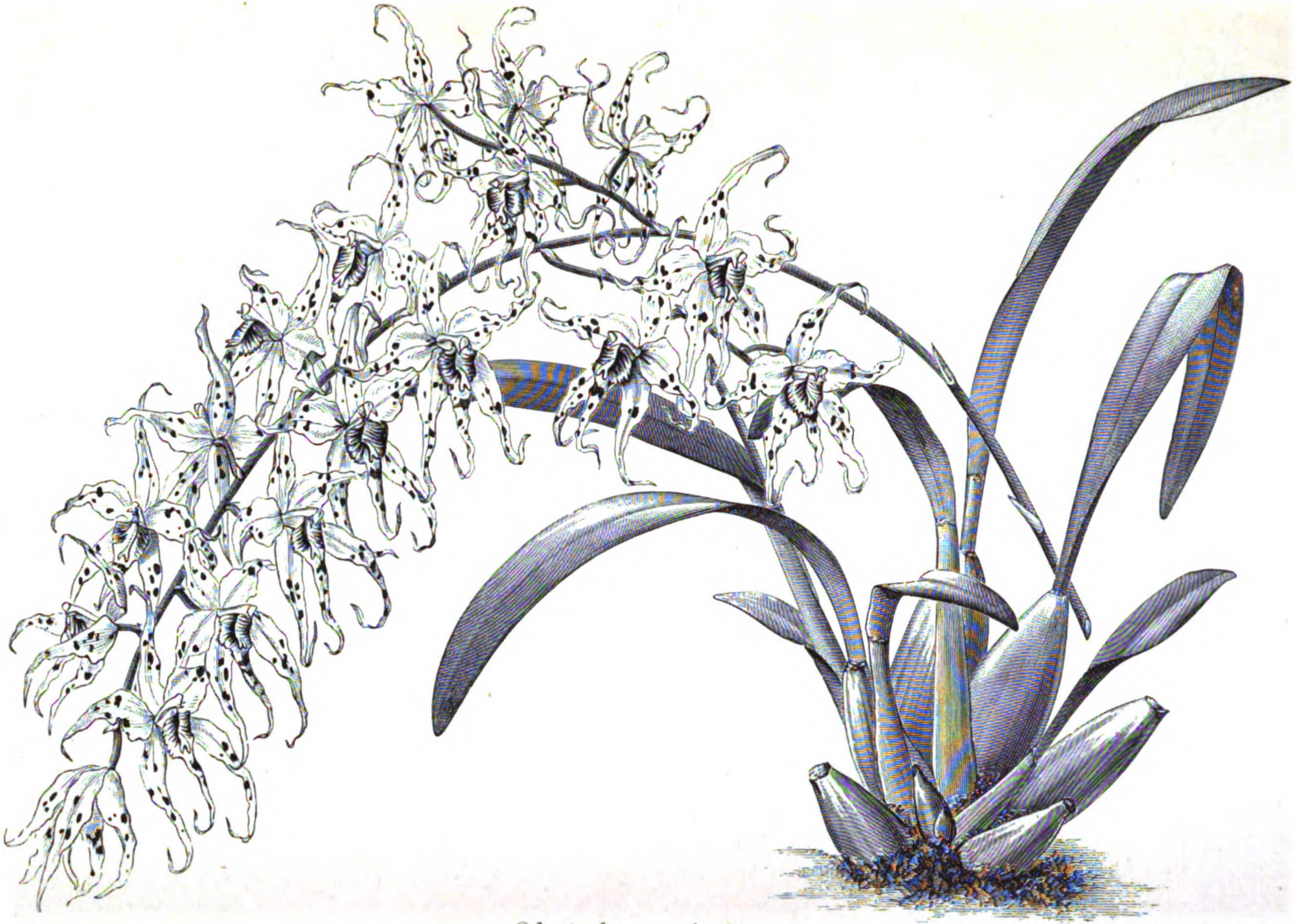
* In his own words, "Species omnino pulcherrima sapientissimo Magistro, DD. Vincentio Cervantes, Botanicus, Professor dicata."

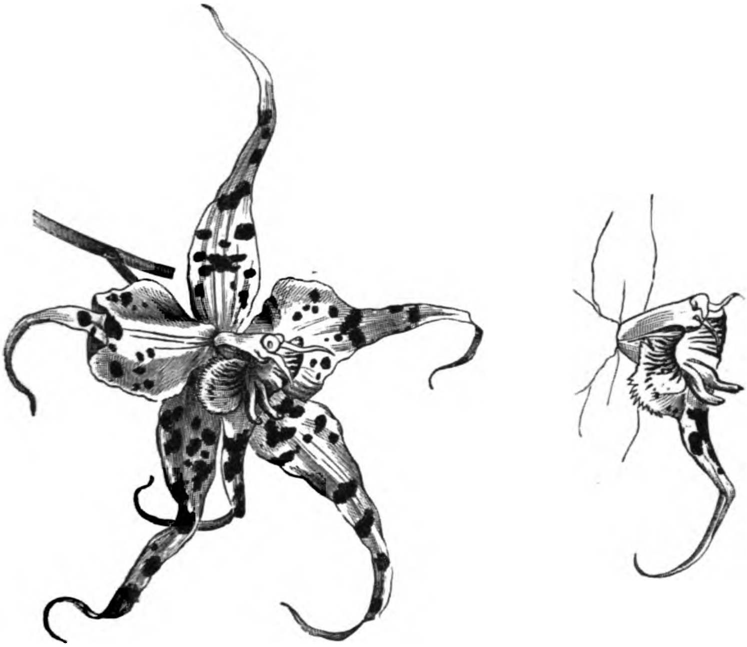


Odontoglossum citrosmum.



Odontoglossum cirrosum.

all other small-bulbed Odontoglots, as *Od. Rossii*, *Od. Krameri*, and *Od. Oerstedii*, shallow pans that can be so suspended should always be preferred.



Odontoglossum cirrosum.

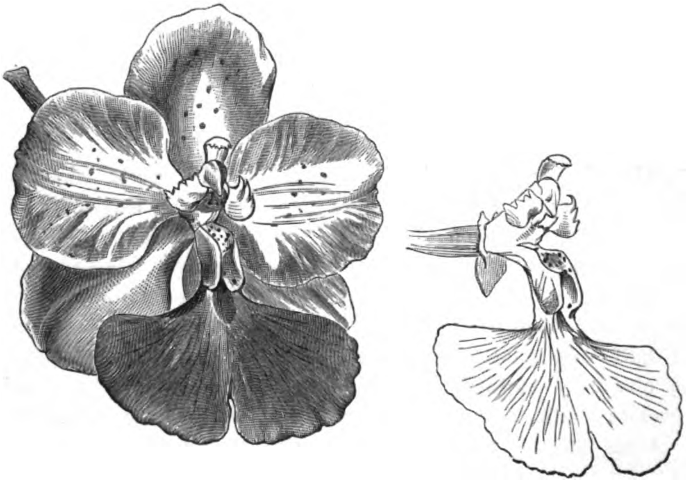
Od. cirrosum.

Pseudo-bulbs nearly oblong, compressed with acute edges, and bearing at their apex one, sometimes two, ensiform leaves, 10—12 inches long. Scape, a many-flowered nodding panicle, 2—3 feet long. Flowers 3—4 inches in diameter; sepals narrow, tapering to thread-like flexuose tails, milk-white spotted with maroon-crimson; petals a little broader than the sepals, and with fewer or without spots on the basal half; lip shorter than the other segments, three-lobed, the side lobes obscurely toothed, the middle lobe tongue-like, reflexed at the tip, white with two or three spots; calli large, covering the two side lobes, bright yellow with radiating red lines, and with two projecting teeth in front. Column angular with two tendril-like cirri at the apex.

Odontoglossum cirrosum, Lindl. Gen. et Sp. Orch. p. 211 (1833). Id. Fol. Orch. Od. No. 5 (1852). Rchb. in Gard. Chron. V. (1876), p. 503. *Bot. Mag.* t. 6317. *Illus. hort.* t. 301. *Fl. Mag.* n. s. t. 222. Williams, *Orch. Alb. IV.* t. 151. Od. Hrubyannm, Hort.

Sub-vars.—*Klabochs'*, flowers somewhat larger than the commoner forms; *Baron Hruby's*, floral segments without spots, or with but few traces of them.

Native of the Ecuadorean Andes, where it was discovered half-a-century ago, by Colonel Hall, and subsequently by Dr. Jameson, the former of whom sent dried flowers to Sir William Hooker, at Kew, from which the species was named and partially described by Dr. Lindley. It was not introduced till 1875, when the brothers Klaboch succeeded in sending to England a consignment of living plants, among which the first to flower in this country were those in the collections of Mr. Spencer Brunton, at Beckenham, and Sir Trevor Lawrence, at Burford Lodge. According to F. C. Lehmann, *Od. cirrosum* is an isolated species, growing on the Western Cordillera, the limits of its distribution lying between 4° S., and 2·15° N. latitude.* The species is variable both in the form of the flowers, and in the markings of their segments. Klabochs' variety is so called in compliment to the successful introducers of the species.† The specific name *cirrosum,* from *cirrus,* "a lock of curled hair," refers to the curled horn-like appendage at the apex of the column. *Od. cirrosum* usually flowers in the months of April and May.



Odontoglossum citrosmum.

Od. citrosmum.

Pseudo-bulbs ovoid, compressed, ancipitous, 4—6 inches long, and 2—3 inches broad, diphyllous. Leaves broadly ligulate, 8—12 inches long, leathery. Scapes pendulous, racemose, many-flowered. Flowers

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* Gard. Chron. XX. (1883), p. 396.

† *Klabochorum,* Gard. Chron. VI. (1876), p. 452.

2½—3 inches in diameter; sepals and petals similar, oval, pure white, but sometimes with the basal portion tinted with pale rose; lip with a long claw suddenly expanded into a reniform blade with a shallow notch in the anterior edge, pale, sometimes deep rose colour; crest two lobed, each lobe with a small notch in the margin, yellow, spotted with red. Column with one dorsal and two lateral wings.

Odontoglossum citrosmum, Lindl. Bot Reg. (1842), mis. 68. *Id.* (1843), t. 3. Id. Fol. Orch. Od. No. 59 (1852). Van Houtte, *Fl. des Serres* (1850), t. 633. Warner's *Sel. Orch. I.* t. 28 (1862-5). De Puydt. *Les Orch.* t. 29. Od. pendulum, Batem. *Monogr. Od.* t. 6 (1874). Cuitlauzina pendula, Lex. Orch. Opus. 36 (1825) ?.

Sub-vars.—*album*, flowers pure white except the yellow crest on the claw of the lip; *punctatum*, flowers pale rose with the sepals and petals dotted with purple; *roseum*, the blade of the lip deep rose.

Od. citrosmum has long been known as one of the most beautiful of the Mexican Odontoglots; it had been made known to science in the early part of the present century, by La Llave and Lexarza, under the name of *Cuitlauzina pendula*, but its identification remained for many years in doubt. It was introduced into England by Mr. George Barker, of Birmingham, through his collector, Ross, about the year 1838, and flowered for the first time in this country in the collection of Mr. T. Brocklehurst, at "The Fence," near Macclesfield, the plant being one of those imported by Mr. Barker. It has an extensive range in its native country, but always at a lower elevation than the other Mexican Odontoglots. Lexarza gives Jesus del Monte, near Valladolid, as its habitat.* M. Roezl found it in immense quantities † growing on oak trees scattered over the park-like plains that occur between the ranges of the Sierra Madre; it has also been reported from Oaxaca and from Guatemala.

In *Od. citrosmum* we have a departure from the usual type of Odontoglots in the scapes being produced simultaneously with the new pseudo-bulbs, in its perfectly pendulous racemes, in the form of the lip, in the absence of the teeth-like processes of the crest, in its three-winged column, and in some other details—differences which were thought sufficient in the early days of Orchidology to give it separate generic rank. The specific name *citrosmum*, from κίτριον (kitrion), " a lemon," and ὀσμή (osmé), " odour," refers to the pleasant lemon fragrance of the flowers, which usually appear in May and June, but sometimes a little later.

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* Orchidianum Opusculum, p. 33.

† La Belgique horticole 1883, p. 229. In the course of his narrative M. Roezl writes, "Great was my surprise to see the trees clothed with a profusion of orchids, which proved to be *Odontoglossum citrosmum*, whose pendulous spikes, a yard long, were adorned with innumerable white and lilac flowers, which perfumed the air with their delightful fragrance. The stoutest branches of the oaks were literally loaded, and it was a pleasure to see the profusion of flowers produced by these plants, a single spike bearing upwards of thirty expanded flowers. During several days' march we noticed that all the oak trees were clothed in this way by this same orchid, which flowers the more freely it is exposed to the direct rays of the sun.

Cultural Note.—Od. citrosmum should be cultivated in the Cattleya house, where the temperature by fire heat ranges through the different seasons of the year from 13°—20° C. (55°—70° F.), the lowest being reached only in severe weather; where the shading is light and only in use during the bright days of summer, and where as much ventilation as possible is admitted at all times, subject to the condition of the external atmosphere. The potting materials should be the same as those used for other Odontoglots; the best time for re-potting is shortly before the plants begin to form new growths; water should be given liberally during the growing and flowering season, but when the plants are at rest, the supply should be diminished to a quantity sufficient only to keep the roots moist and the bulbs plump. When in flower, the plants, if not too massive, may be suspended from the rafters, by which the long pendulous racemes can be more effectively seen; and the greater proximity to the light will also promote more perfectly the maturing of the new growths.

Od. constrictum.

Pseudo-bulbs ovoid, compressed, with acutish edges, diphyllous. Leaves linear-lanceolate, 12—15 inches long. Scapes slender, nodding, racemose or loosely paniculate, many-flowered. Flowers 1½—2 inches in diameter; sepals and petals similar, oblong-lanceolate acute, yellow blotched with reddish brown; lip subpanduriform, apiculate, white with a rose-coloured blotch in front of the calli, which consist of two prominent divergent teeth with erose margin. Column white, with two cirri at the apex.

Odontoglossum constrictum, Lindl. in Bot. Reg. 1884, misc., p. 17. Id. Fol. Orch. Od. No. 2 (1852). *Bot. Mag.* t. 5736 (1868).

var.—Sanderianum.

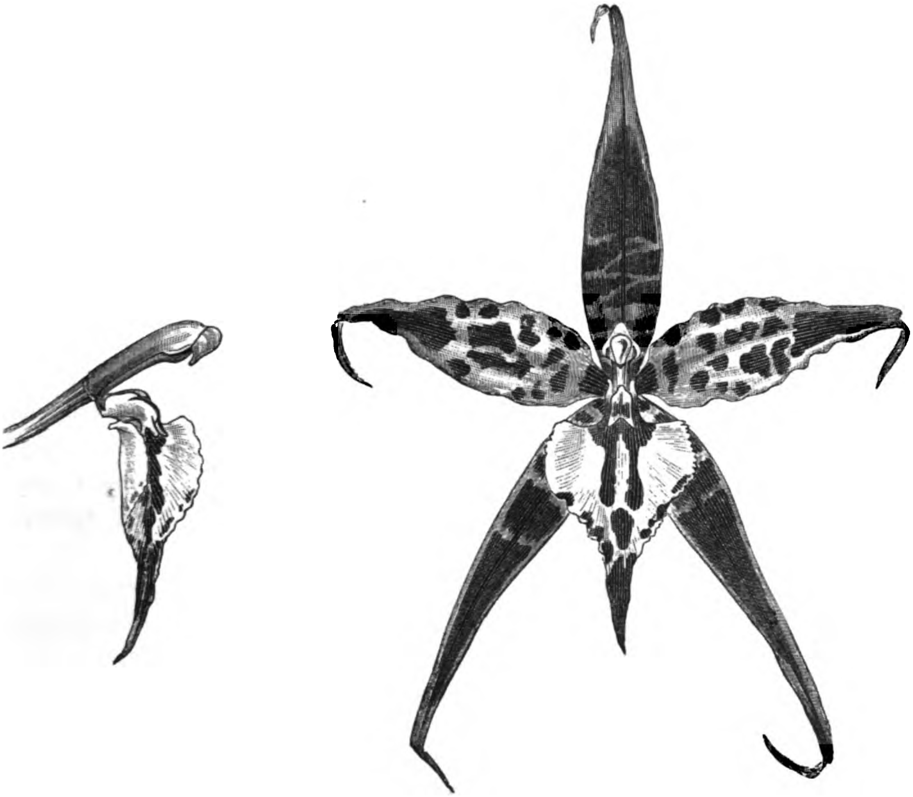
Flowers larger and of brighter colours than the typical *Od. constrictum;* sepals yellow blotched with reddish brown; petals also yellow with a single blotch, and with three longitudinal stripes at the base like those frequently seen on the petals of *Od. odoratum;* lip pale yellow, sometimes white with a rose-purple blotch in front of the calli.

Od. constrictum Sanderianum, supra. Od. Sanderianum, Rchb. in Gard. Chron. XVI. (1881), p. 524.

Od. constrictum was introduced in 1843 from La Guayra and Caracas, where it had been discovered by Linden a short time previously. It flowered for the first time in England in the collections of Mr. Rucker, at Westhill, Wandsworth, and of Mr. Clowes, at

Broughton Hall. The variety, which is of supposed hybrid origin, was introduced by Messrs. Sander & Co., of St. Albans, in 1881. As an horticultural plant it is superior to the species; it is, however, very variable, scarcely any two plants that have been distributed under the name of *Od. Sanderianum* bearing flowers precisely alike.

The flowers of *Od. constrictum* and the variety *Sanderianum* have a pleasant hawthorn fragrance when they first expand, which they usually do in January or February, or even later.



Odontoglossum cordatum.

Od. cordatum.

Pseudo-bulbs produced at short intervals on a slowly-ascending rhizome, ovoid, compressed, with sharp edges, monophyllous. Leaves oblong-lanceolate, 6—8 inches long and 1½—2 inches broad, deep green above, traversed by pale longitudinal nerves. Scapes ancipitous, erect, 1—2 feet high, frequently branched near the base, many-flowered. Flowers

3 inches across, on pedicels (including ovary) 2—2½ inches long, sheathed to half their length by a pale brown membraneous bract; sepals lanceolate, tapering to a sharp point, keeled behind, chestnut-brown tipped with yellow, and with some yellow markings near the base; petals somewhat shorter and broader than the sepals, spotted with reddish brown on a pale yellow ground; lip cordate with an acuminate apex, white with brown spots at the tip and margin, and occasionally along the centre; crest with two erect lobes and a ridge or keel, in front of which are two blunt teeth. Column club-shaped, white and green.

Odontoglossum cordatum, Lindl. Bot. Reg. 1838, misc. 90. Id. Fol. Orch. No. 12 (1852). Paxt. *Mag. of Bot. XIII.* p. 147 (1847). Linden's *Pesc.* t. 26 (1860). *Bot. Mag.* t. 4878 (maculatum). Batem. *Monogr. Od.* t. 25. *Gartenfl.* t. 356. Williams' *Orch. Alb. IV.* t. 186.

Sub-var.—*sulphureum*,* sepals and petals sulphur-yellow; lip white with sulphur tip and blotches.

Introduced by Mr. George Barker, of Birmingham, in whose houses it flowered for the first time in 1838, but owing to the erroneous treatment of Odontoglots that prevailed at that time, it soon disappeared from English collections; it was not till 1854, when it was re-introduced by M. Linden, of Brussels, through Ghiesbreght, that it became once more an occupant of the orchid houses of Europe. *Od. cordatum* is confined to the southern portion of the great Mexican plateau and the adjacent parts of Guatemala. It has sometimes been confounded with *Od. maculatum,* from which it may be easily distinguished by its ascending rhizome, its shorter ovary, sheathed with a longer bract, its longer and narrower sepals and petals, and its more acuminate lip, which is white, and spotted differently.

The sub-variety, which differs only in colour from the type, is a recent introduction; it is in cultivation in Mr. Lee's fine collection at Downside, Leatherhead, and in one or two other places.

Od. coronarium.

A stout rigid plant with a scaly rhizome a little thicker than a goose-quill, on which the pseudo-bulbs are placed at intervals of 2—3 inches. Pseudo-bulbs ovoid, compressed with acute edges, monophyllous. Leaves elliptic oblong, 6—10 inches long and 2—2½ inches broad, very coriaceous. Scapes erect, a little longer than the leaves, many-flowered. Flowers 2—2½ inches in diameter, with a glossy, varnished surface; sepals and petals similar, unguiculate, oblong, with a crisped margin, bright reddish coppery brown bordered with yellow; lip with two ascending auricles from a short claw, and then spreading out into an obcordate, bright yellow blade; crest whitish, three-toothed. Column white, with two truncate wings, which are purple and white.

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* *Od. cordatum sulphureum,* Rchb. in Gard. Chron. XIV. (1880), p. 8.

Odontoglossum coronarium, Lindl. Fol. Orch. No. 60 (1852). Linden's *Pesc.* t. 46 (1860). Batem. *Monogr. Od.* t. 27 (1874). Warner's *Sel. Orch. III.* t. 4. Od. brevifolium,* *Illus. hort.* 1874, t. 170. Williams' *Orch. Alb. I.* t. 27 (1882). Od. candelabrum, Hort. Linden.

var.—chiriquense.

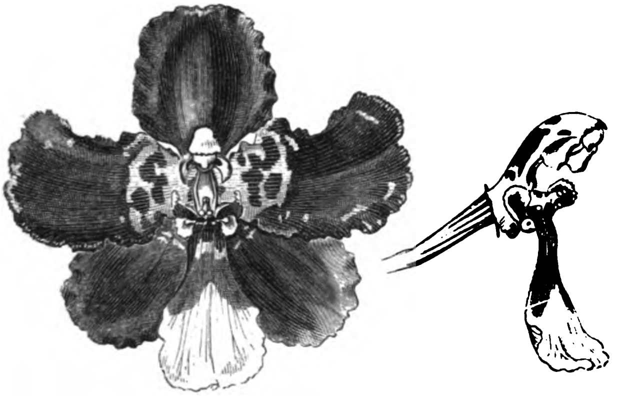
Flowers somewhat larger than those of the typical *Od. coronarium*, and paler in colour; sepals chestnut-brown; petals yellow with some brown markings; lip yellow with a brown blotch on the disc.

Od. coronarium chiriquense, supra. Od. chiriquense, Rchb. in Bot. Zeit. 1852.

var.—miniatum.

Pseudo-bulbs closer together on the rhizome, inflorescence denser with somewhat smaller flowers. Sepals and petals chestnut-brown bordered with yellow; lip yellow.

Od. coronarium miniatum, supra. Od. miniatum, Hort.



Odontoglossum coronarium.

This remarkable Odontoglot was discovered by Messrs. Funck and Schlim in 1847, near La Baja in the Estado Santander, one of the New Granadian States, and subsequently by Schlim near Ocaña, where he collected for M. Linden's establishment at Brussels the first plants that reached Europe alive. Its principal habitat is now known to be the mountainous region lying between Ocaña and Salazar, a distance

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[*] The *Od. brevifolium* of Lindley is quite a distinct plant from *Od. coronarium.* In *Od. brevifolium* not only are the leaves very short, as the specific name implies, but also the inflorescence is different, consisting of a drooping raceme of 10—12 flowers, that are smaller than those of *Od. coronarium.* Although one or two plants of *Od. brevifolium*, apparently true to name, are in cultivation, they cannot, unfortunately, be induced to flower, and it is with regret that we are compelled to omit this fine species from this monograph.

of 70 miles.* In this elevated district, its vertical range is from 8,000—9,500 feet; it grows in the more open parts of the forest on the lower branches of trees, but sometimes on the ground at the foot of the trunks, or upon old and decaying trunks that have fallen through age. The varieties *chiriquense* and *miniatum* appear to be local forms; the first-named was originally discovered by Warscewicz on the Cordillera of Chiriqui, at 8,000—9,000 feet elevation, and has been quite recently introduced by Messrs. Sander and Co., of St. Albans; the second, of which we find no record of origin or authority for name, is said to be Ecuadorian.

Cultural Note.—Ever since its first introduction, the culture of *Od. coronarium* has been attended with difficulty, or at least with results that have not always been satisfactory to those who have had it in their collections; the plants, after making progress for a time, will sometimes cease to grow, and even retrograde, and the flowering in two successive seasons cannot be depended on. The late J. C. Spyers, gardener to Sir Trevor Lawrence, Bart., with whom it frequently flowered, recommended the following treatment: "Owing to its rambling habit, it is useless to try and make it conform to pot treatment; a long, narrow teak box with plenty of drainage holes answers the purpose admirably; it should be grown in peat and sphagnum, kept near the roof-glass of the cool house, and also kept moist the whole year round." † It also grows and flowers freely under nearly the same treatment in Mr. Lee's collection at Downside.

Od. crispum.

Pseudo-bulbs broadly ovoid, compressed with acute edges, about 3 inches long, bearing at their apex two linear-lanceolate, pointed leaves about a foot long. Scapes slender, longer than the leaves, subpendulous or arching, racemose, sometimes paniculate, many-flowered. Flowers polymorphous, 2½—3½ inches in diameter, variable in colour, generally white, or white more or less tinged with rosy mauve, or occasionally pale yellow, sometimes more or less spotted and blotched with red, but always with the disc of the lip bright yellow; sepals ovate-lanceolate, undulate, bluntish at the apex, but often acuminate, and with a prominent keel on the under side; petals broader than the sepals, more or less crumpled, and with erose or dentate margin; lip oblong or subpanduriform, with the edge jagged or toothed, sometimes rotund at the apex, sometimes two-lobed, and not infrequently acute or even apiculate; crest

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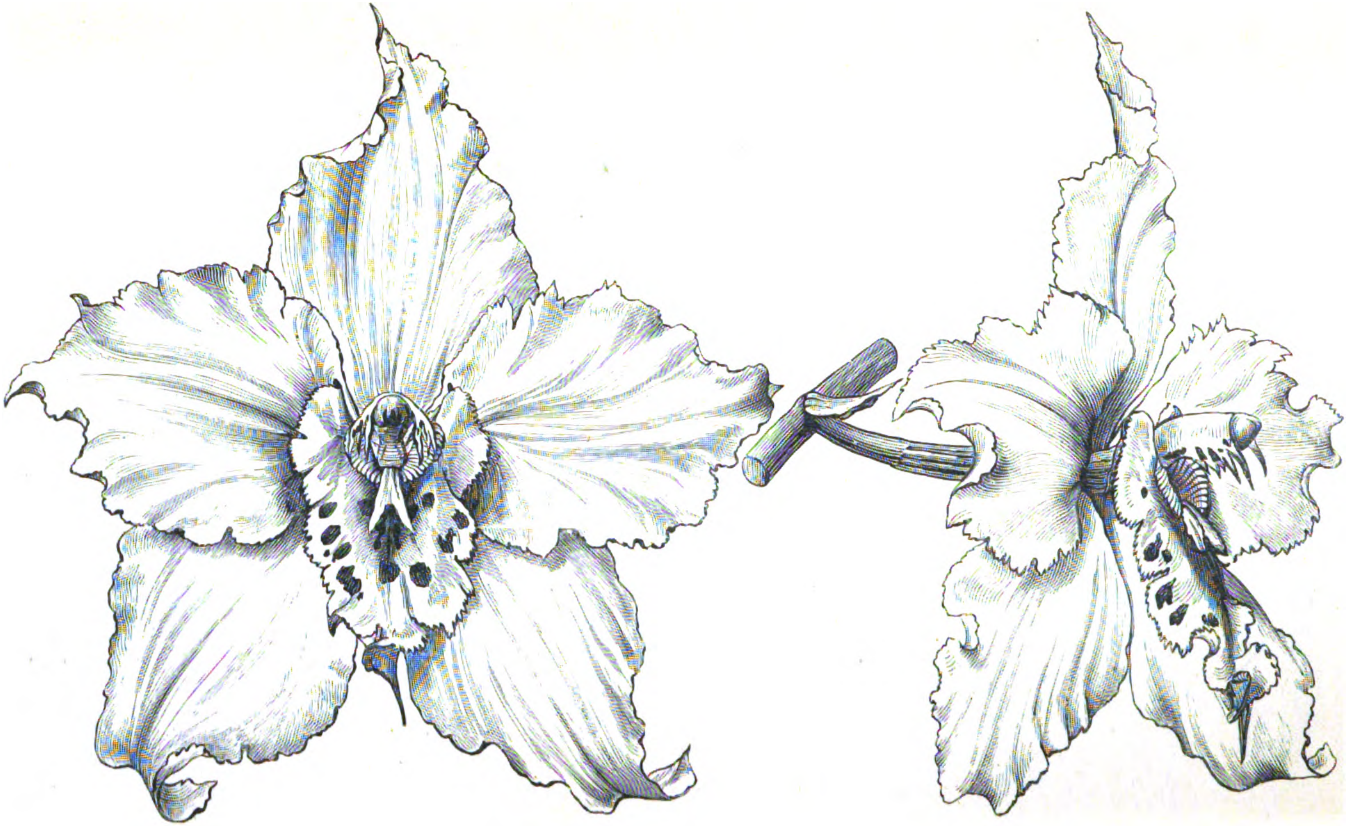
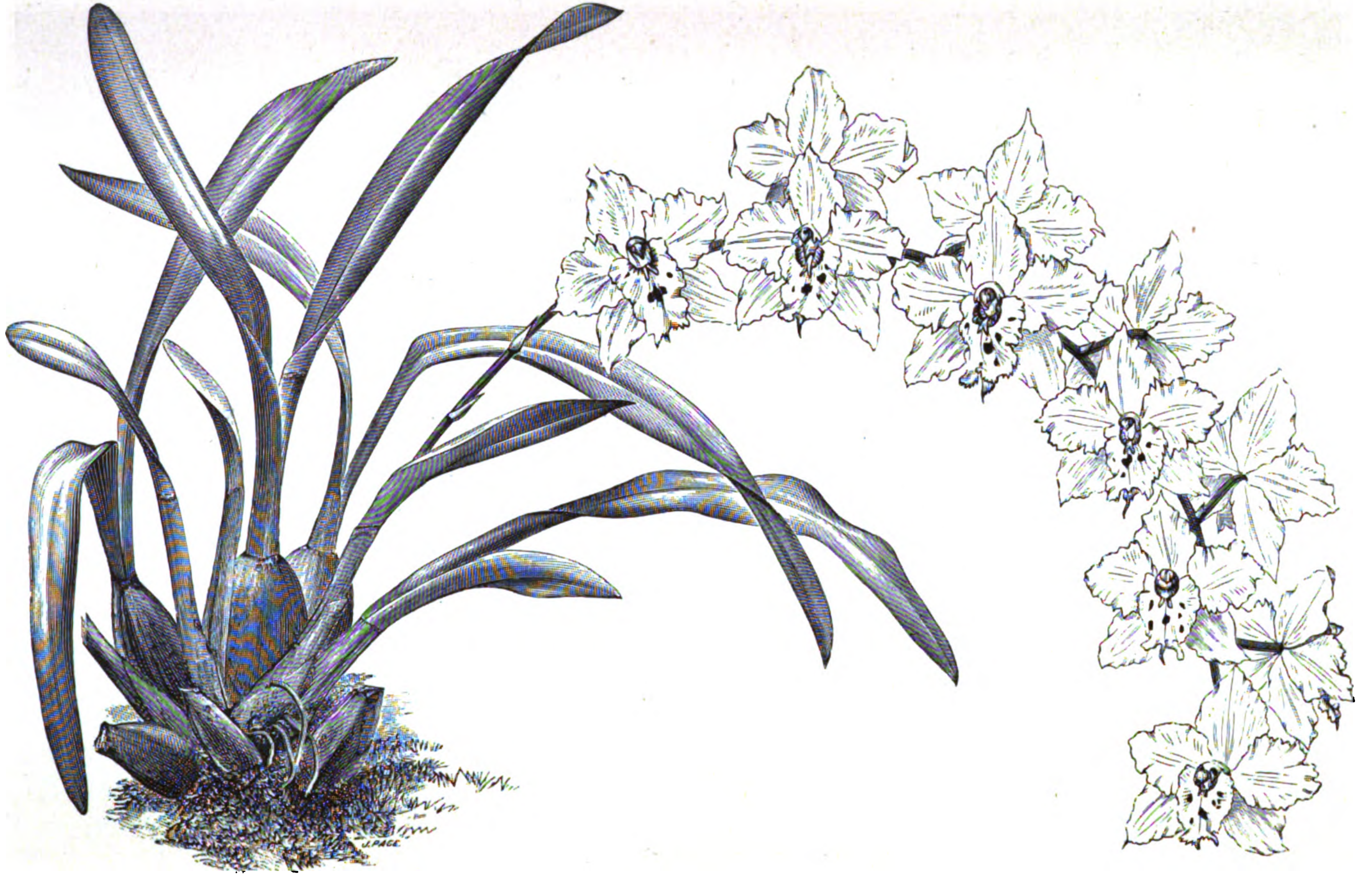
* Kalbreyer in lit.

† Gard. Chron. Aug. 2, 1879. Id. July 17, 1880.



Odontoglossum crispum.

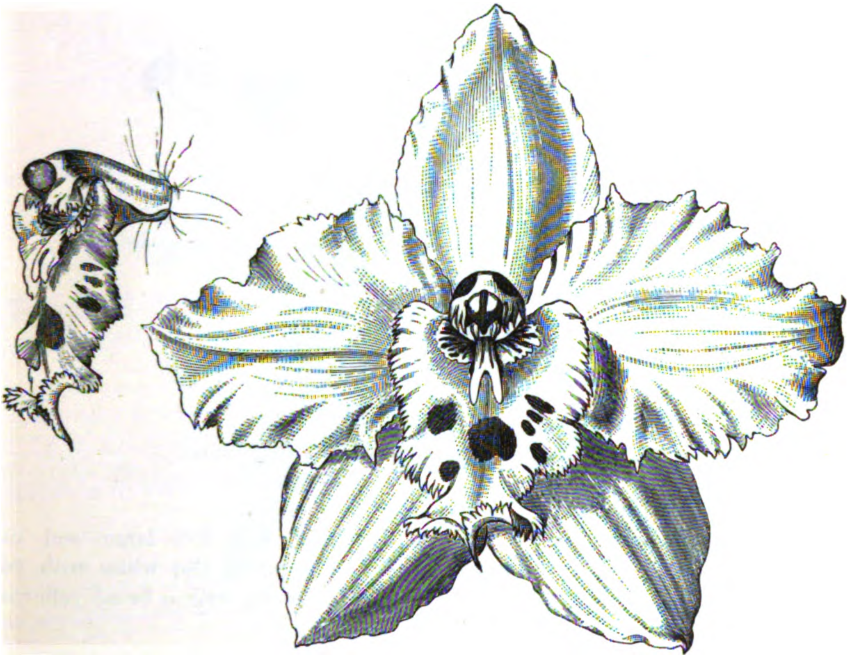
Extra large variety in the collection of C. Walker, Esq., at Brettargh Holt, near Kendal. Flowers white with a few chestnut-brown spots on the lip.



Odontoglossum crispum.

expanded into two yellow lobes barred with red and terminating in two diverging teeth. Column slightly arched, with two broad jagged wings.

Odontoglossum crispum, Lindl. in Ann. Nat. Hist. 15, p. 256, fide Fol. Orch. Od. No. 57 (1852). Sander's *Reichenbachia* t. 1 (1886). Od. Alexandræ, Batem. in Gard. Chron. 1864, p. 1083. Id. *Monogr. Od.* tt. 14, 19 (1874). Bot. Mag. t. 5691 (var. Trianæ). *Fl. Mag.* t. 343. Jennings' *Orch.* t. 26. Williams' *Orch. Alb. I.* t. 47. Od. Bluntii, Rchb. in Bot. Zeit. 1864, No. 53. Van Houtte's *Fl. des Serres*, t. 1652.



Odontoglossum crispum.

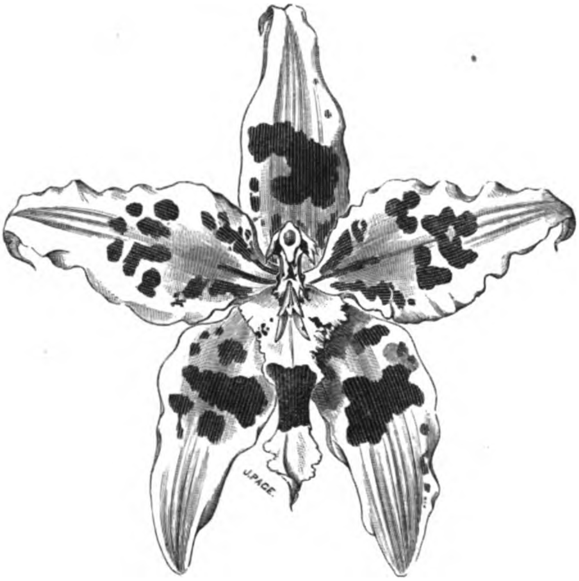
var.—Andersonianum.

Sepals and petals narrower and more pointed than in the more common *crispum* forms, yellowish or cream-white streaked and spotted with chestnut-brown; lip coloured in the same way as the other segments, but not infrequently with a single large blotch in front of the crest.

Od. crispum Andersonianum, supra. Od. Andersonianum, Rchb. in Gard. Chron. 1868, p. 599. *Fl. Mag.* n. s. t. 45 (1872). Williams' *Orch. Alb. I.* t. 35 (1882).

Sub-vars.—*angustatum*, the floral segments narrower and more pointed, the blotches on the petals larger; *lobatum*, (Rchb. Gard. Chron. XI. (1879), p. 74), side lobes of lip narrower and spreading, spots deep cinnamon-red; *Mr. Pollett's*, sepals and petals tinged with rosy mauve towards their apices, and much blotched with chocolate-red in their central parts; lip white, with a large chocolate blotch in front of the crest; *tenue*, (Rchb. Gard. Chron. IX. (1878),

p. 492), flowers smaller, milk-white with a brown blotch on each sepal; also *Josephinæ*, *obtusatum*, *pictum*, &c.



Odontoglossum crispum Andersonianum (Mr. Pollett's variety).

var.—Chestertonii.

Sepals and petals broad, the sepals white with two large and one small reddish brown transverse blotch; the petals also white with two to five reddish brown spots; the lips reddish brown with a broad yellowish white margin.

Od. crispum Chestertonii, Rchb. in lit.

var.—Jenningsianum.

Sepals and petals more oval, the latter with the margins much less cut and crisped; the sepals with a few red-brown blotches, and the petals with numerous spots aggregated chiefly on the basal half, those in the middle being crimson, while those around them are brown; the lip with two or three irregular red-brown spots in front of the crest.

Od. crispum Jenningsianum, supra. Od. Jenningsianum, Rchb. in Gard. Chron. IX. (1878), p. 366.

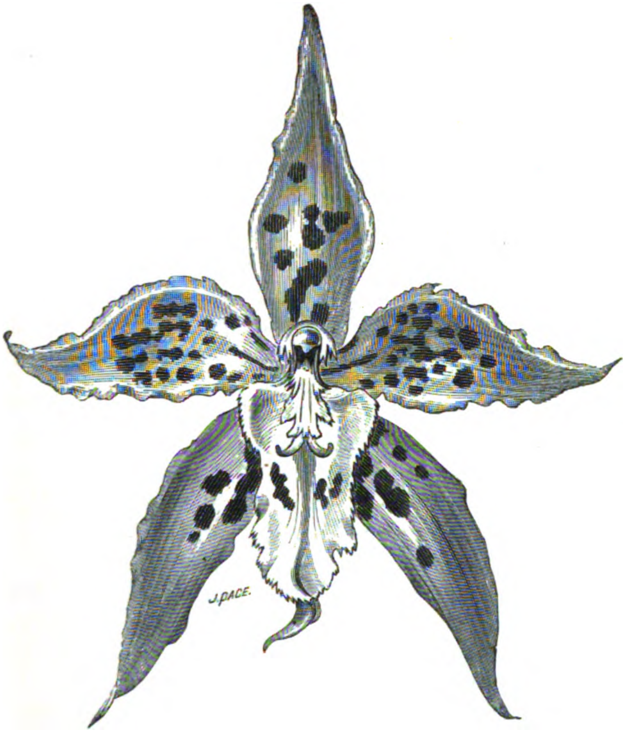
var.—limbatum.

"Sepals lanceolate, triangulate; petals rhomboidal, acute, minutely lobate or dentate; lower part of claw of lip adnate to base of column; column incurved at the middle, angulate at the sides." Flowers white with the sepals tinted with pale rose, and the anterior edge of lip margined with violet spots.

Od. crispum limbatum, supra. Od. limbatum, Rchb. in Gard. Chron. (1870), p. 714; Id. Xen. Orch. II. p. 192.

var.—Ruckerianum.

Inflorescence paniculate in the original type; flowers with narrower segments, white, which in the sepals and petals is bordered with purplish rose and spotted on the basal half with chestnut-brown; lip yellow at the base with a few chestnut-brown blotches on the blade.*



Odontoglossum crispum Ruckerianum.

Od. crispum Ruckerianum, supra. Od. Ruckerianum, Rchb., in Gard. Chron. (1873), p. 105.

Sub-vars. (or forms distinguishable by colour only).—*apiatum* (Gard. Chron. XXV. (1886), p. 568), all the segments with one large and two smaller central chestnut-brown blotches; the sepals stained with violet-purple; *Ballantine's* (Gard. Chron. XXIV. (1885), p. 12), sepals and petals with a large sanguineous purple blotch in the centre; lip with large red-brown spots around the crest; *Baron Schroeder's*,

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[*] Many plants in cultivation under the name of *Od. Ruckerianum* deviate considerably from the type described above. Their inflorescence is racemose, and the sepals and petals, although tinged with purplish rose, the coloration is not marginal, but spread over nearly the whole surface; the spotting, too, is different, notably on the basal half of the petals, where the spots are generally small and numerous, and on the blade of the lip, where there is usually one large transverse blotch midway between the crest and the apex. And similarly with the varieties *Chestertonii* and *Jenningsianum;* most of the forms in cultivation under these names differ more or less from the original types.

all the segments with one—sometimes two—large deep red-brown blotches, and 2—3 smaller ones; in addition to these, are several spots of the same colour scattered over the remaining white area; *fastuosum* (Gard. Chron. XVII. (1882), p. 182), sepals with a broad central stripe of rosy lilac and with a few large circular chestnut spots; petals white, with one or two chestnut spots; lip with some large spots in the centre; *flaveolum* (Rchb. in Gard. Chron. XIII. (1880), p. 41), (Williams' *Orch. Alb. I.* t. 43), sepals and petals primrose-yellow, lip deeper yellow with three or four red circular spots; *guttatum* (*Bot. Mag.*, t. 5697), (Williams' *Orch. Alb. II. t.* 94), sepals and petals white with 4—6 oval or circular reddish brown spots on the central parts, and a larger number on the lip arranged in a belt round the calli; *Mr. Cookson's* (Williams' *Orch. Alb. III.* t. 118), sepals with 3—5 large brown-purple blotches; petals with several smaller oval blotches irregularly placed; lip with one large blotch in front and some smaller ones on each side of the crest; *Mr. Day's*, sepals with an irregular central mauve-purple blotch; petals with 1—2 circular spots and a streak at the base; lip white; *Mr. Wilson's* (Gard. Chron. XVIII. (1882), p. 664), segments pale rose, the sepals with 1—2 brown spots and the lip with one large and 2—3 smaller brown spots; *Stevens'* (Williams' *Orch. Alb. III.* t. 127), sepals with 2—3 large, and petals with 6—8 smaller unequal red-brown blotches; lip with a large blotch in front of the crest and 1—2 small ones on each side of it; *The Duchess* (Gard. Chron. XVIII. (1882), p. 664), sepals and petals pure white, broad with crisped margin; lip with a large red-brown blotch in front of the crest; *Veitch's* (Rchb. in Gard. Chron. XXII. (1884), p. 7), (*Florist and Pomol.* 1884, p. 177), the centre of each sepal and petal occupied by a large chestnut-brown blotch and one or two smaller ones, these are surrounded with a zone of delicate mauve, the border is broad and white; the lip is also white with a few chestnut spots in front of the yellow disc and calli.*

Other forms are known as *aureum* (Orch. Alb. III. sub. t. 131); *Baron Hruby's* (Gard. Chron. XXVI. (1886), p. 166); *Dellieuse*, (Id. XXIV. (1881), p. 589); *elegantissimum*, Id.; *lilacinum*, Id.; *Reginæ*, (*Orch. Alb. VI.* t. 264); *roseum*, (*Fl. Mag.* n. s. t. 269); *roseum punctatissimum*, (Gard. Chron. XXVI. (1885), p. 588); *Rothschildianum*, (Id. XXI. (1884), p. 609); *Sanderianum*, (Id. XXIV. (1885), p. 12); *Shuttleworthii*, (Id. XXIV. (1885), p. 620); *sulphureum*, (Id. XVII. (1882), p. 182); *virginale*, (Id. XX. (1883), p. 307), &c., &c.

The merit of the discovery of this lovely Odontoglot is due to Karl Theodor Hartweg, who gathered it near Pacho, in the province of Bogota, during a trip to the Cordilleras of New Granada in 1841-2, undertaken for the purpose of collecting plants for the Horticultural Society of London. From Hartweg's specimens it was described by Dr. Lindley in his *Folia Orchidacea* under the name of *Od. crispum,* and to him, therefore, and contemporary orchidologists, the beauty of the species became known or at least surmised; but owing to the "incredible folly persisted in at that time of growing cool Orchids in hot stoves," * which resulted in the cultivation of Odontoglots being regarded as hopeless, no efforts were made to secure for the Orchid-houses of Europe this and other treasures of the New Granadian Cordilleras till many years afterwards. With the introduction of a more rational cultural treatment of alpine epiphytal Orchids, and its

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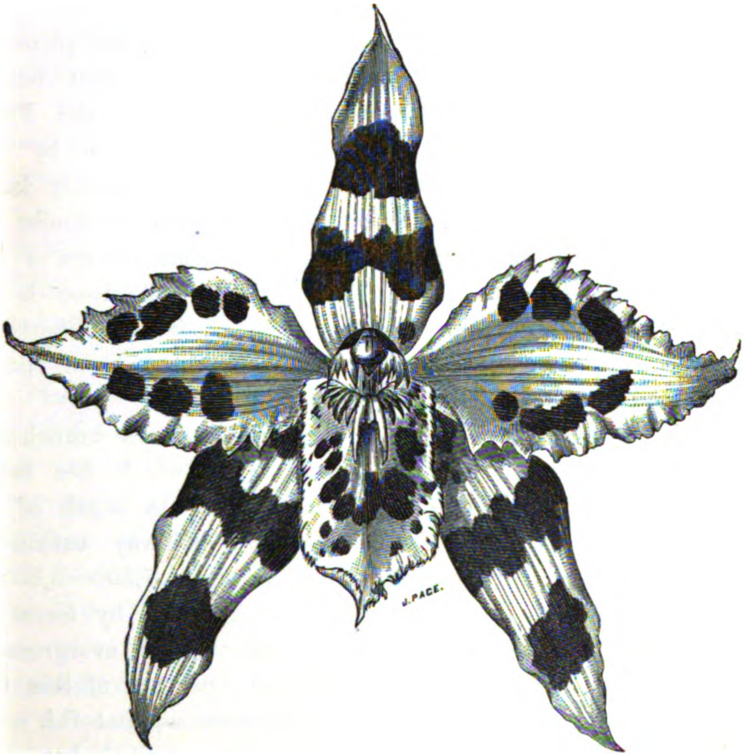
* This remarkable form is now in the collection of Baron Schroeder, who, struck by the analogy between it and *Od. Pescatorei, Veitch's var.* (*vide infra*), requested Professor Reichenbach to name it in compliment to the head of our firm. We had previously exhibited it under the name of *Od. crispum mirabile.*



Odontoglossum crispum (spotted variety).

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* Bateman Monogr. of Odont. Intr.

attendant success, arose also the desire to possess the beautiful species of Odontoglossum discovered by Hartweg, Linden, Warscewicz, and others; accordingly, in 1863, the collectors Weir, Blunt, and Schlim were sent out to New Granada respectively by the Horticultural Society of London, Messrs. Low and Co., of Clapton, and Mr. Linden, at that time established as an horticulturist in Brussels.* All of them succeeded in sending home living plants to their respective patrons, the first to flower in Europe being one in the collection of Mr. John Day, at Tottenham, and which had been collected by Blunt, near Pacho. Mr. Bateman, failing to identify the plants sent home by Weir with the *Od. crispum* of Lindley, and believing them to be a new species, dedicated it as such to the Princess of Wales, under the name of *Od. Alexandræ*, the name by which it is still, and probably will long continue to be, popularly known; it is curious, too, that Prof. Reichenbach fell into a similar error with respect to some of Messrs. Low's plants, some flowers of which were sent to him for identification, but which at the time he considered to be new to science, and named them *Od. Bluntii*, the extreme variability of the species being then unknown, and, perhaps, not even suspected.†

The native home of *Od. crispum* is on the western branches and spurs of that portion of the eastern Cordillera which lies between lat. 3·45° and 5·50° N.,‡ a distance from north to south of about 180 miles, having the city of Bogota about midway between the northern and southern limits. Its vertical range is 7,500—8,800 feet elevation, a zone that in those regions is occupied by forest composed chiefly of cinchonaceous trees, walnuts, and evergreen oak *Quercus tolimensis*. It is in the occasional openings of this forest, and especially along the numerous mountain streams, that *Od. crispum* occurs; it grows chiefly on the trunks and principal branches of the trees where there is partial shade, and occasionally in full exposure, but never in the dense primeval forest. Two localities have become well-known from the vast number of plants that have been collected in them: Pacho, 30 miles N. of Bogota, and Fusagasugà, 25 miles south of that city; from the former place most of the finest spotted varieties have been received, and from the latter the white and mauve tinted forms. The variety *Andersonianum* first appeared among an importation of Messrs. Low and Co. in 1867-8, and subsequently among our own and other importations; it is of supposed hybrid origin, *Od. odoratum* being remotely concerned in the parentage; it is named in compliment to James Anderson, formerly gardener to the late Mr. James Dawson, of Meadow Bank, near Glasgow. The variety *Chestertonii* was sent to us by the collector, whose name it bears; the typical plant is now in the collection of Baron Schroeder; *Jenningsianum* was also one of our own introductions, and is of supposed similar origin as *Andersonianum*, as is *limbatum*, which appeared among some plants of *Od. crispum* acquired by Mr. John Day for his former collection at Tottenham. *Ruckerianum* first appeared in the collection of the late Mr. Rucker at West Hill, Wandsworth, and in its typical form is one of the most distinct of the varieties of *Od. crispum.*

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* It is recorded as a curious coincidence, that the three collectors named above all found themselves sailing for the same destination, in the same steamer, and on the same errand. *Batem. Monogr. Intr.*

† Professor Reichenbach expresses the same thing in "*Reichenbachia,*" page 1. He says:—"In those days no one could foresee the protean nature of such things. As a fact, I never had any difficulty in recognising what is Mr. Bateman's *Alexandræ* and what is my *Bluntii.*"

‡ F. C. Lehmann in Gard. Chron. XX. (1883), p. 395.

The usual flowering period of established plants of *Od. crispum* and its varieties is from the middle of February to the end of April; but this species possesses the remarkable property of sending up flowering spikes at any time during active growth; hence, where a large number of plants are cultivated, the flowering season is considerably prolonged; indeed, there is scarcely a month in the year in which this charming Odontoglot may not be seen in flower.

Od. cristatum.

Pseudo-bulbs cylindro-conical, ribbed, 2 inches long, diphyllous. Leaves linear-lorate, acute, 7—10 inches long. Scapes longer than the leaves, racemose, many-flowered. Flowers 2—2½ inches in diameter; sepals and petals similar, ovate-lanceolate, acute, chestnut-brown tipped with yellow and with a yellow blotch at the base; lip similar but shorter, pale yellow, sometimes white, with a large apical and a few small marginal blotches of chestnut-brown; crest large, consisting of two converging lamellæ, each of which is cut into numerous awl-shaped white and brown segments, of which the two anterior ones are broader than the others. Column winged.

Odontoglossum cristatum, Lindl. Fol Orch. Od. No. 53 (1852). Rchb. in Gard. Chron. 1868, p. 1014. *Illus. hort.* 1870, t. 21.

var.—cristatellum.

Sepals and petals broader and differently coloured; lip yellow at base and brown at apex; teeth of crest yellow and red.

Od. cristatum cristatellum, supra Od. cristatellum, Rchb. in Gard. Chron. X. (1878), p. 716. Williams' *Orch. Alb. II.* t. 66. Od. Lehmanni, Lehm. in lit. fide Rchb. in Gard. Chron. XVII. (1882), p. 143.

Discovered by Hartweg on the Ecuadorean Andes, near Paccha, in 1841. It remained unknown, except as an herbarium specimen, till M. Gustav Wallis sent living plants to M. Linden's horticultural establishment in 1867. The variety, which is of supposed hybrid origin and is still very rare, was imported ten years later by Mr. Bull. The specific name refers to the conspicuous crest. *Od. cristatum* usually flowers in April and May.

Od. crocidipterum.

Pseudo-bulbs, leaves, and inflorescence as in *Od. blandum.* Flowers 1½ inches in diameter; sepals and petals lanceolate, acute, reflexed at the tips, pale yellow spotted with orange-brown; lip clawed with two erect side laciniæ and a sub-hastate triangular blade, denticulate at the margin and attenuated at the apex, which is reflexed like the other segments, pale yellow with some marginal orange-brown spots and one or two larger ones near the apex; crest bilamellate white. Column with fringed wings.

Odontoglossum crocidipterum, Rchb. in Gard. Chron. 1871, p. 1129. Id., *Xen. Orch. II.* p. 209, t. 192 (1874).

Introduced by Messrs. Low and Co. in 1870; it had, however, been previously communicated to Professor Reichenbach by the same firm, who had received herbarium specimens from its discoverer, Bruckmüller.* It has a limited range on the Eastern Cordillera of New Granada, between Ocaña and Pamplona, at 6,000—7,500 feet elevation, growing on the trunks and branches of trees in partial shade, and occasionally in company with *Od. triumphans.* In its native home it flowers in April; in the Orchid-houses of Europe in the same month, but not infrequently in different seasons of the year; its flowers emit a pleasant hawthorn fragrance when first expanded.

The specific name, *crocidipterum*—"saffron-winged"—from κρόκος (krokos), "saffron," and δίπτερος (dipteros), "having two wings," refers to the yellow tint of the spreading perianth.

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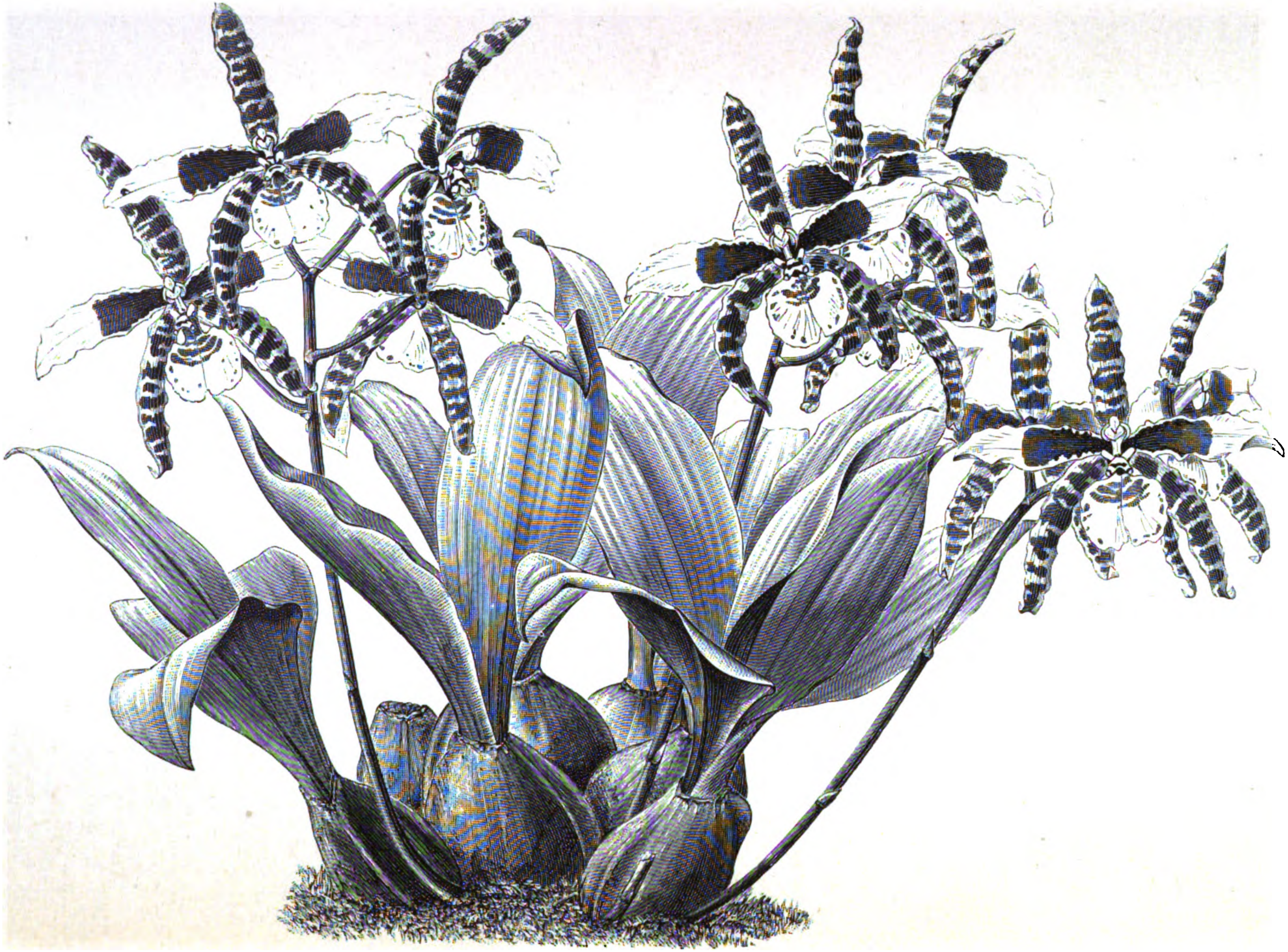
* Xen. Orch. II. p. 209.



Odontoglossum grande.

Od. Edwardi.

Pseudo-bulbs ovoid, smooth, compressed with acute edges, 4½ inches long and 2½ inches broad, diphyllous. Leaves ligulate, sub-acute, complicate at base, keeled and striated beneath. Scapes robust, 3—4 feet or more high, dull crimson below, and with a sheathing bract at each joint, pale green above and paniculate. Flowers numerous, about an inch in diameter, purplish mauve or puce colour, except the calli on the lip, which are buff-yellow surrounded with a narrow sulphur-yellow zone; sepals and petals similar, oblong, obtuse, clawed, wavy, the lateral sepals a little narrower than the petals and dorsal sepal; lip shorter than the other segments, tongue-shaped, deflexed; crest fleshy, tuberculose, obscurely bipartite. Column short with a narrow toothed wing on each side of the stigmatic cavity.

Odontoglossum Edwardi, Rchb. in Gard. Chron. X. (1878), p. 74. Idem, XIII. (1880), p. 72. *Bot Mag.* t. 6771 (1884).

A very distinct Odontoglot, native of the Andes of Ecuador, where it was discovered by the German traveller, Edward Klaboch, whose labours it will long preserve in remembrance. Although the flowers are comparatively small, they are remarkable for their colour, in which they differ from every other Odontoglot in cultivation: they possess also the additional recommendation of being fragrant. *Od. Edwardi* flowered for the first time in this country in the collection of Mr. H. J. Buchan, at Wilton House, Southampton, in January, 1880.

Od. grande.

Pseudo-bulbs ovoid, compressed, 3—4 inches long, di-triphyllous, easily distinguished by their deep pea-green colour. Leaves oval-oblong, 4—5 inches long. Scapes longer than the leaves, stoutish, erect, 4—7 flowered. Flowers 5—6 inches across; sepals oblong-lanceolate, bright yellow barred with cinnamon-brown; petals oblong, as broad again as the sepals, basal half cinnamon-brown bordered with yellow, distal half bright yellow; lip sub-orbicular, pale yellow, sometimes whitish with a few pale red blotches; crest fleshy with two truncate processes in front and 2—4 teeth at the base, orange-yellow. Column downy with a small auricle on each side.

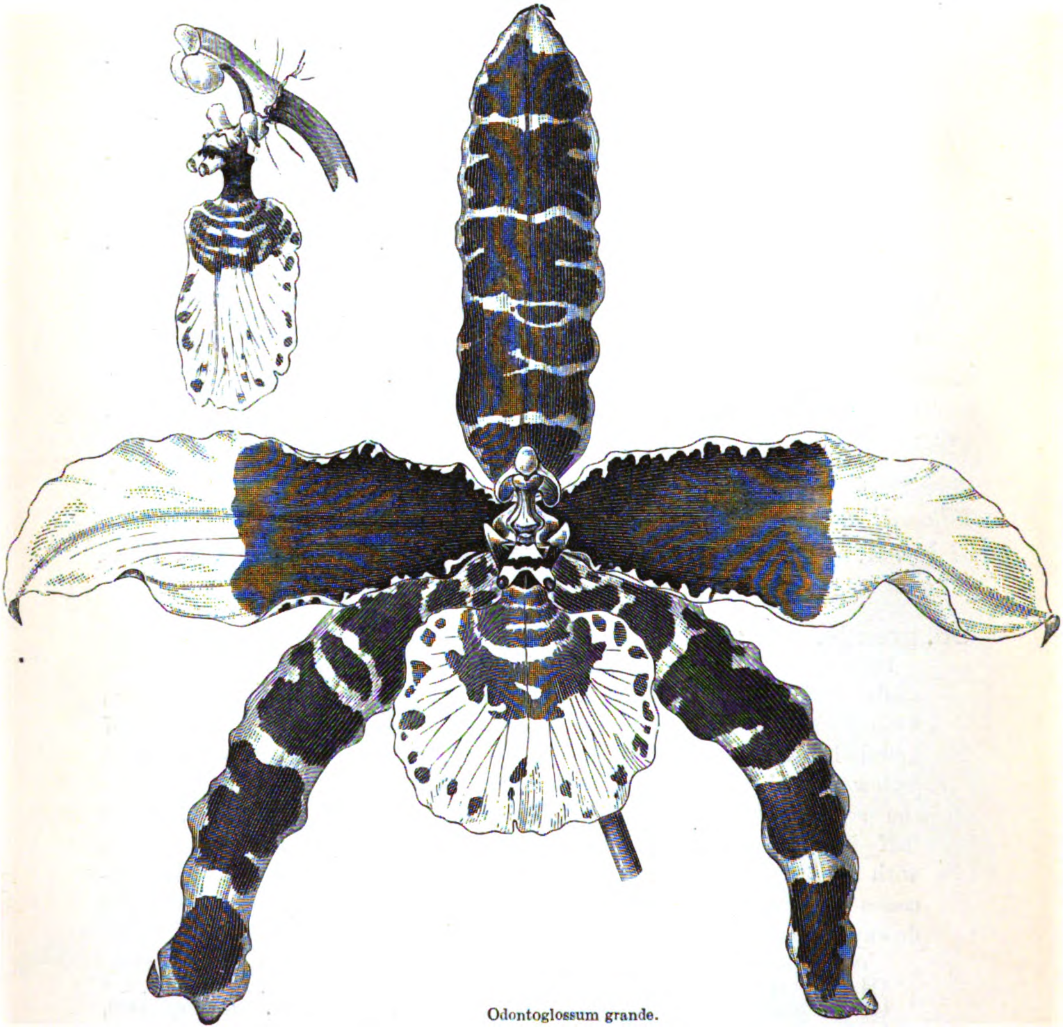
Odontoglossum grande, Lindl. in Bot. Reg. 1840, misc. No. 94. Id. Fol. Orch. Od. No. 9 (1852). Batem. *Orch. Mex. et Guat.* t. 24 (1843). Id. *Monogr. Od.* t. 8 (1874). *Bot. Mag.* t. 3955. Paxt. *Mag. Bot. VIII.* (1841), p. 49. *Gartenfl.* 1859, t. 270. Jenning's *Orch.* t. 13. Williams' *Orch. Alb. II.* t. 79.

var.—Williamsianum.

Flowers smaller with shorter and broader petals; column with uncinate wings.

Od. grande Williamsianum, supra. Od. Williamsianum, Rchb. in Gard. Chron. XVI. (1881), p. 134. Williams' *Orch. Alb. IV.* t. 163.

This, the largest flowered of all known Odontoglots, was discovered by Mr. G. Ure Skinner, in 1839, in dark ravines near the city of Guatemala, and afterwards in other localities, but invariably in a climate of which the ordinary range of temperature is between 15° and 20° C. (60°—70° F.), and in situations where it is secure of moisture and constant shade.* It flowered for the first time in this country in the collection of the Duke of Bedford, at Woburn


Odontoglossum grande.

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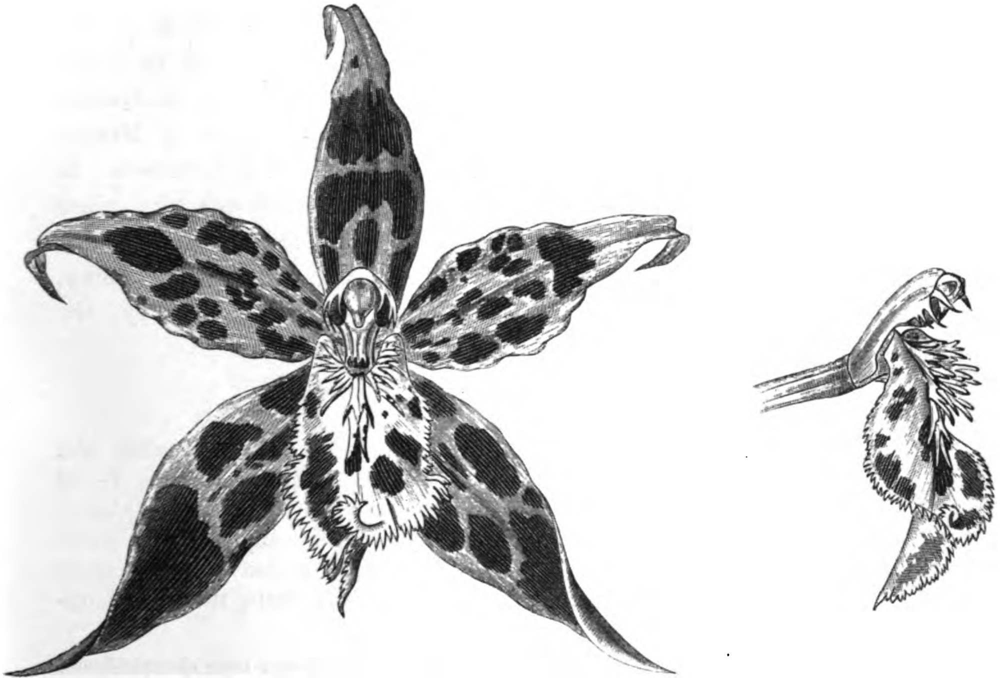
* Batem. Orch. Mex. et Guat. sub. t. 24.

Abbey, in 1841. The variety *Williamsianum,* a unique plant, in the collection of Comte de Germiny, at Gouville, near Rouen, is said to be a native of Costa Rica. *Od. grande* usually flowers from November to March, but not infrequently one to two months earlier.

Cultural Note.—The climatic conditions under which *Od. grande* and its nearest affinities, *Od. Insleayi* and *Od. Schlieperianum,* are found growing in their native countries are somewhat different from those under which the alpine species of New Granada live. The average mean temperature is higher, and there is a dry season of from four to five months' duration; it is, therefore, advisable to remove these Odontoglots from the cool house on the approach of the winter season, to the coolest and driest part of the Cattleya house, where they can have a period of rest. The humidity of the Odontoglossum-house during the winter months is unfavourable to them.



Odontoglossum Halli.

Od. Halli.

Pseudo-bulbs ovoid, elongated, much compressed with acute edges, and when old, channelled longitudinally with narrow close-set furrows, diphyllous. Leaves linear-lanceolate, 10—15 inches long.* Scape 36—60

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* Es giebt zwei Sorten. Eine hat kürzere, breitere Blätter und nicht so zahlreiche schön gezeichnete Blüthen, deren Lippe rein weiss mit roth gefleckt (*leucoglossum*). Die andere Abart hat längere, schmälere Blätter und grosse Bluthen, welche jedoch von Farbe schmutzig (*xanthoglossum*). Rchb. Otia. bot. Hamb. p. 21.

inches long, arching, racemose, many-flowered. Flowers 3—4 inches across; sepals and petals similar and sub-equal, elliptic-lanceolate, acute with reflexed tips, variable in colour, and especially so as regards the spotting;[*] lip oblong, acuminate, jagged at the edge, shorter and broader than the other segments, pale yellow or white, more or less spotted with red; crest bright yellow, consisting of two pectinate lobes and terminating in front in two white diverging bifid teeth. Column with two cirrose wings near the apex.

Odontoglossum Halli, Lindl. Bot. Reg. 1837, sub. t. 1992. Id. Fol. Orch. Od. No. 6 (1852). Rchb. *Xen. Orch.* I. t. 63 (1856). *Illus. hort.* 1871, t. 58. *Fl. Mag.* 1868, t. 378. Batem. *Monogr. Od.* t. 21. *Bot. Mag.* t. 6237. Warner's *Sel. Orch. III.* t. 10. Od. chætestroma, Rchb. in Gard. Chron XIX. (1883), p. 562.[†]

Od. Halli, the grandest of the Ecuadorean Odontoglots, was discovered by the gallant officer whose name it bears, Col. Hall, in 1837, in the Andean valley of Lloa, in the Quito district, at 8,000 feet elevation. A few years afterwards, Hartweg gathered it on the western slopes of Pichincha, and later, Professor Jameson in other localities on the Andes; but it was not till 1864—5 that it became known in European collections, through the importations of Messrs. Low and Co., M. Linden, Messrs. Backhouse, and ourselves. It usually flowers in March and April; when out of flower, the plant may be distinguished by its long, thin, and narrow pseudo-bulbs with parallel close-set longitudinal furrows. It is a variable species, and several fine forms have received especial notice by the horticultural press.

Od. Harryanum.

Pseudo-bulbs oval-oblong, compressed, furrowed and ribbed when old, 2½—3 inches long, diphyllous. Leaves leathery, oblong, obtuse, 7—10 inches long. (Scapes but imperfectly developed from the imported plants) Flowers 3—3½ inches across, vertically; sepals elliptic-oblong, wavy, deep chestnut-brown marked and tipped with golden yellow; petals oblong, acute, reflexed at the tips, the basal half white, traversed longitudinally by broad, close-set mauve-purple lines; central area chestnut-brown, apical part yellow; lip oval-oblong, three-lobed, the side lobes rotund, turned upwards, white, heavily striped with mauve-purple, the anterior lobe sub-cordate, white, changing to pale yellow; crest deeply fimbriate in front, golden yellow. Column terete with two minute apical toothed wings, white at the base, changing to yellow upwards.

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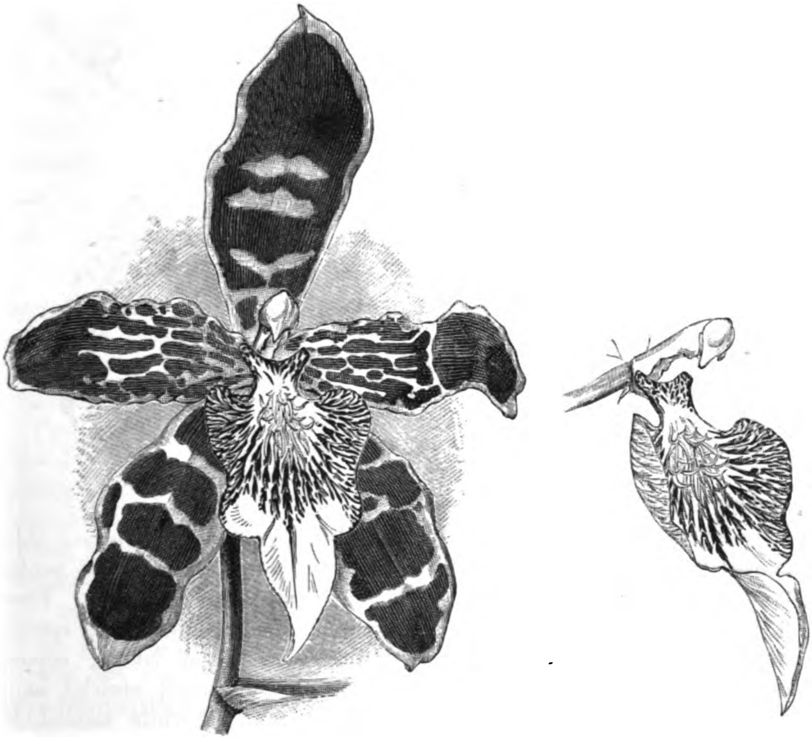
[*] In the best types the tips of the sepals are bright yellow, then a large chestnut-brown blotch, sometimes divided into two or more by thin yellow bars, the basal half yellow with some oblong spots of various sizes; the petals are more heavily tipped with yellow, the spots on the basal area smaller, more numerous, and arranged in slightly irregular longitudinal lines.

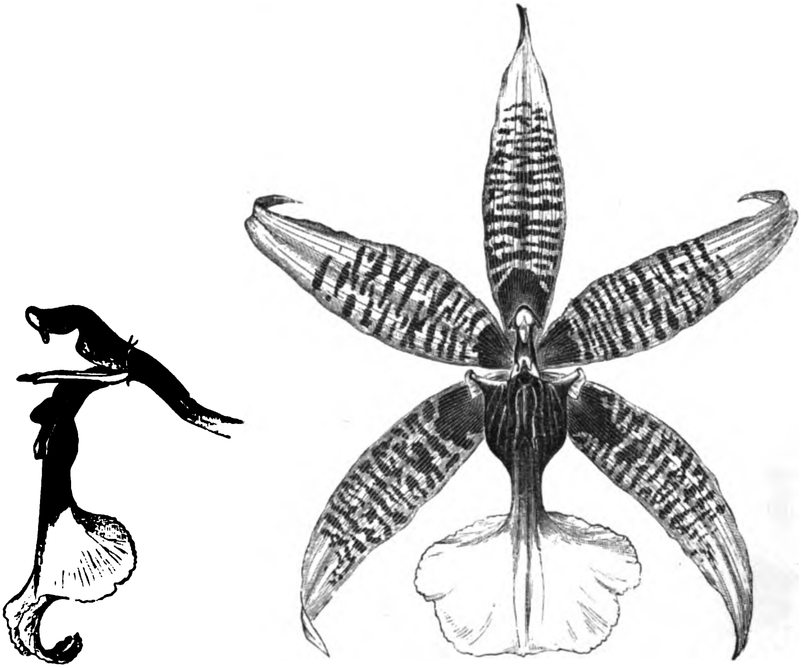
[†] Not seen by us. It is said to be a natural hybrid between *Od. Halli* and *Od. cristatum,* differing from the former chiefly (fide Reichenbach) "in the bristles of the crest being more numerous, the anterior lamellæ narrower, and the blade of the lip broader in the anterior part."—Gard. Chron. XIX. (1883), p. 592. To *Od. Halli* may also probably be referred *Od. Victor,* Rchb., Id. p. 532, not seen by us; it is said to differ from *Od. Halli* chiefly in its more pandurated lip, which is broader at the top.

Odontoglossum Harryanum, Rchb. in Gard. Chron. XXVI. (1886), p. 486.

The latest important addition to the genus up to the time of the publication of this monograph. It was imported by Messrs. Horsman and Co. of Colchester, from whom we acquired the stock but who gave no intimation of its habitat. Two of the imported plants flowered in August, 1886, but the scapes being imperfectly developed bore but 2—3 flowers each. Established plants may be expected to produce many-flowered scapes, 2—3 feet long, and should this be verified, the plant will be one of the finest Odontoglots known. It is named in compliment to the head of our


Odontoglossum Harryanum.

firm by Professor Reichenbach, who remarks that "it is a fresh type, a grand and unexpected surprise, comparable with *Od. luteo-purpureum* and *Od. tripudians*."



Odontoglossum hastilabium.

Od. hastilabium.

Pseudo-bulbs ovoid, compressed, ancipitous, diphyllous. Leaves oblong-lanceolate, about a foot long, complicate at base. Scape erect, panicled, 3—4 feet long, but often much longer in its native country. Flowers 3 inches in diameter; sepals and petals similar, lanceolate, spreading in a stellate manner, pale greenish yellow or cream colour, copiously barred and spotted with purple; lip with two small auricles at the base and a broadly hastate, acute blade, which is white stained with purple; crest consisting of three posterior lamellæ, of which the middle one is the largest, and two smaller anterior ones, all deep purple, as is the wingless column, except its anther case, which is white and a bright yellow spot at the base.

Odontoglossum **hastilabium**, Lindl. Orch. Lind. p. 16. Id. Fol. Orch. Od. No. 51 (1852). *Bot. Mag.* t. 4272 (1846). Linden's *Pesc.* t. 11 (1860). Batem. *Monogr. Od.* t. 7 (1874).

A stately species, one of the discoveries of M. Linden, who met with it on the eastern Cordillera of New Granada, in the Estado

Santander, in 1843. It was next found by Purdie near Santa Marta, in the extreme north-east of New Grenada while collecting for the Royal Gardens at Kew, and subsequently in other localities by Schlim and Wagener. It is sparingly met with in the neighbourhood of Ocaña, where it occurs at a somewhat lower elevation than is usual for Odontoglots, forming large masses on the surface of the ground, the roots creeping to a considerable distance among the decaying vegetation. On the Sierra Nevada de Santa Marta it is more abundant; here, at an elevation of 6,000—7,500 feet, it is usually found attached to the stems of enormous Lianas overhanging the mountain streams, exposed to the influence of the rapid evaporation which is constantly going on in the daytime in a temperature that ranges from 10°—15° C. (50°—60° F.), but which is considerably lower during the night. Under these conditions it forms pseudo-bulbs 6 inches long, and its stately panicles attain a length of 4—6 feet.* The first recorded instance of its flowering in England was at Syon House in August, 1846;† its flowering season, however, both in its native country and in the glass-houses of Europe, is from January to April, but sometimes later. The specific name refers to the form of the labellum (halbert-shaped).

Od. Insleayi.

Pseudo-bulbs, leaves, and inflorescence as in *Od. grande.* Flowers 2½—3 inches in diameter; sepals and petals similar and sub-equal, oblong, wavy, pale greenish yellow barred with reddish brown; lip obovate, bright yellow bordered with a belt of red spots; crest consisting of a central plate with two conical processes in front and two elongated teeth at the base. Column with two incurved cirrate wings.

Odontoglossum Insleayi, Barker in Bot. Reg. 1840, misc. 21. Lindl. Fol. Orch. Od. No. 8 (1852). Warner's *Sel. Orch. II.* t. 25 (1865—75). Batem. *Monogr. Od.* t. 4 (1874). Oncidium Insleayi, Batem. *Orch. Mex. et Guat.* t. 21. Paxt. *Mag. Bot. VIII.* (1841), p. 203. Od. Lawrenceanum, Hort.

var.—leopardinum

Sepals and petals broader, chestnut-brown, barred and margined with yellow; lip bright yellow, with a marginal zone of deep red blotches.

Od. Insleayi leopardinum, Regel's *Gartenfl.* 1876, t. 856.

var.—pantherinum.

Sepals and petals broader, chestnut-brown with paler margin, the whole of the lip arabesqued with red and yellow.

Od. Insleayi pantherinum, Rchb. in Gard. Chron. 1873, p. 1302.

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* M. Roezl in Godefroy's Orchidophile, March, 1881, p. 91.

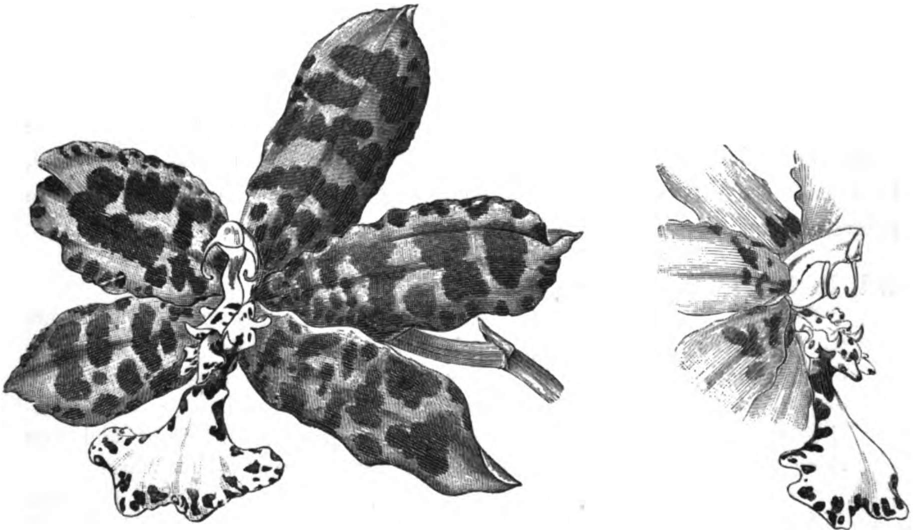
† Bot. Mag. sub. t. 4272.

var.—splendens.

Flowers larger than the typical *Od. Insleayi;* sepals and petals of a uniform ochreous-yellow; lip canary-yellow with a broad marginal zone of red blotches.

Od. Insleayi splendens, Rchb. in Gard. Chron. 1868, p. 1038. *The Garden, XXV.* t. 428. Williams' *Orch. Alb. V.* t. 215.* Sander's *Reich.* t. 7.

Od. Insleayi was introduced by Mr. Barker, of Birmingham, in 1838 or 1839, through his collector, Ross, who met with it in the neighbourhood of Oaxaca in Mexico. As with most of the earlier introduced Odontoglots, it appears to have succumbed to the stifling heat of the stoves, to which all Orchids were at that time consigned, for nothing more was heard of it for upwards of a quarter of a century, when it reappeared in several private collections, but through whose agency we cannot now trace; and later in 1866, when it was imported from Mexico in quantity by Messrs. Low and Co., who also introduced the variety *splendens*. *Leopardinum* and *pantherinum*, which are more strictly colour or sub-varieties, appeared in 1873. The usual flowering season of *Od. Insleayi* and its varieties is August and September, but the flower scapes frequently appear at other, and even at opposite seasons. The specific name was given by Mr. Barker, in compliment to Insleay, his gardener at the time of its introduction.



Odontoglossum Insleayi.

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* The flowers figured here have yellow-brown sepals and petals margined and barred with pale yellow.

Od. Krameri.

A dwarf plant. Pseudo-bulbs sub-orbicular, 1½ inches in diameter, much compressed, monophyllous. Leaves oblong-lanceolate, 7—9 inches long. Scapes drooping or ascending, 3—5 flowered. Flowers 1½ inches in diameter; sepals and petals similar, oblong, acute, pale violet in the centre shading off to white at the margin; lip with a short claw on which are two bright yellow calli; blade semilunate, two-lobed at the apex, purplish violet with bands of white and reddish brown at the base. Column short, wingless, white.

Odontoglossum Krameri, Rchb. in Gard. Chron. 1868, p. 98. *Fl. Mag.* 1868, t. 406. *Bot. Mag.* t. 5778. Batem. *Monogr. Od.* t. 24. Van Houtte's *Fl. des Serres*, t. 2469. Williams' *Orch. Alb. I.* t. 40. *Illus. hort.* t. 562.

Od. Krameri is a native of Costa Rica, from which country it was introduced by us in 1868 through Carl Kramer, a son of the late Mr. Kramer, of Flotbeck, near Hamburg, long known as one of the most skilful cultivators of Orchids in Germany. It is a rare plant, said to be restricted to a single locality on the mountain slopes near the Pacific Coast, but where it is also said to have been well-nigh exterminated through the destruction of the forests for agricultural purposes.* As a species, it is interesting botanically as being the nearest ally of *Od. citrosmum*, and for the geographical position of its habitat.

Cultural Note.—*Od. Krameri* requires an equable temperature throughout the year; that is, a range of about 13°—18° C. (55°—65° F.), or even a little higher during the period of active growth Hence, the Cattleya house is suitable for its cultivation, and here it should be suspended near the roof-glass, receiving partial shade on hot days, with liberal waterings when growing, and light and ventilation with little water when at rest during the winter. This treatment approximates as near as practicable to the climatic conditions under which it lives in its native country.

Od. læve.

A robust plant. Pseudo-bulbs ovoid, 3—4 inches long, compressed, ancipitous, generally with two or more ridges on the flattened sides, diphyllous. Leaves oblong-lanceolate, 9—12 inches long. Scapes 24—36 inches long, dull claret-red spotted with green, paniculate, many-flowered. Flowers 2½ inches in diameter; sepals and petals nearly equal, linear-oblong, cinnamon-brown, tipped and barred with yellow or yellow-green; lip shorter than the other segments, sub-pandurate, apiculate, rosy lilac and white, sometimes pale rose, sometimes all white; calli 3—5, but sometimes obsolete. Column short, whitish, with a small wing on each side of the stigmatic cavity.

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* R. Pfau in Gard. Chron. XX. (1883), p. 658.

Odontoglossum læve, Lindl. *Bot. Reg.* 1844, t. 39. Fol. Orch. Od. No. 53 (1852). Batem. *Monogr. Od.* t. 16. *Illus. hort.* 1859, t. 213. *Bot. Mag.* t. 6265. Od. Reichenheimii, Rchb. in Bonpl. III. (1855), p. 214.* Linden's *Pesc.* t. 19. Batem. *Monogr. Od.* t. 15. Miltonia Karwinskii, Paxt. *Mag. Bot. XVI.* p.162 (1850). Lindl. Fol. Orch. Miltonia, No. 2. Cyrtochilum Karwinskii, Lindl. Bot. Reg. sub. t. 1992 (1837).

A polymorphous species somewhat extensively distributed over southern Mexico and Guatemala. It was sent to England from the last-named country, both by Mr. G. Ure Skinner and Hartweg in 1841, to the Horticultural Society of London, in whose garden at Chiswick it flowered in the spring of the following year. It had been gathered a few years previously by Count Karwinsky, and afterwards by Hartweg in the neighbourhood of Oaxaca, and it was subsequently found by Ghiesbreght in the oak forests of the western declivities of the Cordillera of Michoacan, at 7,000—8,000 feet elevation.

Od. læve is one of the least attractive of the Central American Odontoglots, but its flowers are very fragrant when first expanded. The absence of all but rudimentary calli on the lip marks its near affinity to the Miltonias; the specific name *læve*—"smooth"—has reference to this circumstance.

Od. Lindenii.

Pseudo-bulbs pyriform, 5—7 inches long, diphyllous. Leaves 12—18 inches long, linear, rigid. Scapes erect, 24—30 inches long, racemose at the extremity, 7—12 flowered. Flowers 1½ inches in diameter, lemon-yellow; sepals and petals lanceolate, undulate; lip ovate-lanceolate, a little shorter than the other segments; crest consisting of two parallel erect lobes with a shorter intermediate one, and four small diverging teeth in front. Column wingless.

Odontoglossum Lindenii, Lindl. Fol. Orch. Od. No. 46, (1852). *Fl. Mag.* n. s. t. 333 (1878). Od. platyodon, Rchb. in Gard. Chron. 1871, p. 1163.

Discovered by M. Linden in 1842—3, in New Granada, locality not recorded, but it does not appear to have been introduced to European gardens till many years afterwards, the earliest instance we know of, of its flowering in this country, being in October, 1871, in Mr. Day's collection at Tottenham.

Od. Lindleyanum.

Pseudo-bulbs, leaves, and inflorescence as in *Od. crispum.* Flowers 2—3 inches in diameter; sepals and petals similar, linear-lanceolate,

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* Horticulturists, however, sometimes distinguish by this name a form with somewhat smaller flowers of a brighter colour.

acute, yellow with a reddish brown blotch in the middle and some smaller ones towards the base, where they are sometimes arranged in parallel lines; lip shorter than the other segments, obscurely three-lobed, lateral lobes white with a few purple spots, middle lobe lanceolate, acute, reflexed, reddish brown tipped with pale yellow; calli two, horn-like, white. Column with two narrow wings.

Odontoglossum Lindleyanum, Rchb. in Bonpl. II. p. 99 (1854). Id. *Xen. Orch. I.* p. 195, t. 71 (1856). Batem. *Monogr. Od.* t. XI. (1874).

var.—Coradinei.

Flowers larger with broader segments; sepals and petals pale tawny yellow with 1—3 reddish brown blotches; lip not acute, but apiculate, with a large square red-brown blotch in front of the calli, around which are a few spots of the same colour; calli yellow and red.

Od. Lindleyanum Coradinei, supra. Od. Coradinei, Rchb. in Gard. Chron. 1872, p. 1068. Id. *Xen. Orch. II.* p. 208, t. 192. Williams' *Orch. Alb. II.* t. 90.

var.—ligulare.

Differs from the preceding chiefly in its broader lip and duller colours; sepals and petals sulphur-yellow with two or three chestnut-brown blotches; lip chestnut-brown with a pale yellow tip.

Od. Lindleyanum ligulare, supra. Od. ligulare, Rchb. in Gard. Chron. XVII. (1882), p. 558.

var.—mirandum.

More robust in habit than the commoner forms, and with flowers of brighter colours; sepals and petals reddish brown tipped and bordered with yellow; lip chestnut-brown tipped with yellow, claw whitish with a few purple markings.

Od. Lindleyanum mirandum, supra. Od. mirandum, Rchb. in Gard. Chron. XVII. (1882), p. 143.*

Od. Lindleyanum is one of the most widely distributed of the New Granadian Odontoglots; it occurs on the eastern Cordillera in various localities between Bogota and Ocaña, often mixed with *Od. crispum,* and sometimes with *Od. odoratum, Od. luteo-purpureum,* and others; it also inhabits the central Cordillera from the Nevada de Tolima northwards.† It was originally discovered by Linden in 1842-3, by whom it was communicated to Dr. Lindley, who referred it to *Od. epidendroides* (Humbt. et Kunth),‡ but was afterwards pronounced by Reichenbach to be distinct.§ It was sent by Weir to the Horticultural Society of London in 1863, in whose garden at Chiswick it flowered in the spring of the following year. The variety *Coradinei* appeared among one of our own importations of *Od. crispum* in 1872; *ligulare* appeared ten years later in the collection of Lord Rothschild, at Tring Park; both varieties are of supposed hybrid origin, *Od. crispum* being remotely concerned in the parentage. *Mirandum* has been gathered at various times by several collectors both on the central and eastern Cordilleras. All these forms are more or less connected by intermediate links that have since appeared, and which form a series almost as confluent as the *crispo-odoratum* group.

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* A sub-variety of this, with shorter and broader segments, has been called *Od. mirandum breve.*

† Kalbreyer in lit. ‡ Fol. Orch. Od., No. 1.

§ Xen. Orch. I. p. 195, t. 71. *Od. tentaculatum,* Rchb. in Gard. Chron. XIX. (1883), p. 814, may, perhaps, be also referred to this group.

Od. Londesboroughianum.

A rambling plant. Rhizome as thick as the little finger, from which the pseudo-bulbs are produced at intervals of 2—3 inches. Pseudo-bulbs ovoid, compressed, 3 inches long, diphyllous. Leaves ligulate, 12—15 inches long, deciduous. Scapes 2—3 feet long, ascending, racemose. Flowers 1½ inches in diameter; sepals and petals oblong, apiculate, bright yellow with concentric brown markings; lip with a narrow claw on each side of which is a small auricle; blade reniform with a shallow sinus in the anterior margin, bright yellow with some reddish spots at the base; callus triangulate with a small tubercle on each side. Column slender, falcate, wingless.

Odontoglossum Londesboroughianum, Rchb. in Gard. Chron. VI. (1876), p. 1876 *Fl. Mag.* n. s. t. 246 (1877). Williams' *Orch. Alb. II.* t. 82. Od. oncidioides, Hort.

A recent addition to the genus, it having been introduced by Messrs. Backhouse, of York, in 1876, in which year it flowered for the first time in England in the collection of Lord Londesborough, at Norbiton, in Surrey. It is a native of Mexico, but the locality in which it was gathered has not been divulged.* In the Orchid-houses of Europe it usually flowers in the autumn months. The flowers, as well as the vegetative organs, have altogether the aspect of an Oncidium, but the elongated column, which is not swollen at the base, shows that one of the essential characters of Oncidium is absent.

Cultural Note.—A suitable arrangement must be made for the rambling habit of the plant; this may be provided for either by a large block or raft with a thin coating of moss, or by a long narrow basket with some peat and sphagnum to root in; or still better, when practicable, by inserting in a large pot a portion of the stem of a tree-fern 3 feet long and 3 or 4 inches in diameter, around which the flexuose rhizome can creep, and to which it can be made secure with wire. The plant should be placed in a position where it can receive a maximum of sun-light and sun-heat, such as near the roof-glass of the Cattleya house. In such a position the climatic conditions under which it grows in its native country can be more approximately imitated, and its treatment as regards watering, &c., can be regulated accordingly.

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* Messrs. Backhouse, in a communication to the *Gardeners' Chronicle*, XI. (1879), p. 342, state that they are unable to give this desirable information, their collector having informed them that it (*Od. Londesboroughianum*) grows on shelving rocks, fully exposed to the sun, and where the temperature rises to 50° C. (120° F.) in the day, and falls to 13° C. (55° F.) at night. They add that they have received *Od. citrosmum* from the same region, if not from the identical district.

Od. luteo-purpureum.

Pseudo-bulbs, leaves, and inflorescence as in *Od. crispum*, but "larger in all their parts." Flowers 3—4 inches in diameter; sepals and petals nearly equal, oblong-lanceolate, acuminate, the former chestnut-brown tipped and marked in various ways with yellow, the latter yellow blotched and spotted with brown, the superior margin sometimes irregularly toothed in the middle, but sometimes sinuate, sometimes entire; lip subpanduriform, the side edges sometimes entire, sometimes dentate and even fringed, anterior edge dentate or fringed, sometimes apiculate, white or yellow with a large chestnut-brown spot in front of the calli; calli variable, usually consisting of a number of bristle-like processes pointing forwards, of which two groups coalesce into two anterior diverging teeth. Column bent, with two lacerated wings, which are sometimes reduced to one or two horn-like projections on each side near the apex.

Odontoglossum luteo-purpureum, Lindl. Orch. Lind. p. 16. Id. Fol. Orch. Od. No. 7 (1852). Batem. *Monogr. Od.* t. 17 (1874). Williams' *Orch. Alb. VI.* t. 254. Od. hystrix, Batem. in Gard. Chron. 1864, p. 1202. Od. radiatum, Rchb. in Gard. Chron. 1865. p. 746. Od. lyroglossum, Gard. Chron. XVII. (1882), p. 632, icon. xyl.

var.—amplissimum.

Sepals and petals broader than in the commoner forms, clear pale yellow blotched and spotted with cinnamon-brown; lip smaller.

Od. luteo-purpureum amplissimum, Rchb. in Gard. Chron. XVII. (1882), p. 525.

var.—cuspidatum.

Sepals and petals somewhat narrower than in the commoner forms, yellow blotched with chestnut-brown; lip ligulate, acuminate, wavy, pale yellow with a large square chestnut-brown blotch in the centre

Od. luteo-purpureum cuspidatum, supra. Od. cuspidatum, Rchb. *Xen. Orch. II.* p. 194, t. 184. Id. in Gard. Chron. XV. (1881), p. 428.

var.—facetum.

Sepals and petals elliptic-lanceolate, blotched and spotted in various ways with cinnamon-brown, the petals in addition having some crimson markings near their base.

Od. luteo-purpureum facetum, supra. Od. facetum, Rchb. in Gard. Chron. XV. (1880), p. 563. Od. prænitens, Hort.*

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* Nearly all the plants in cultivation under the name of *Od. prænitens* are referable to this form of *Od. luteo-purpureum.*

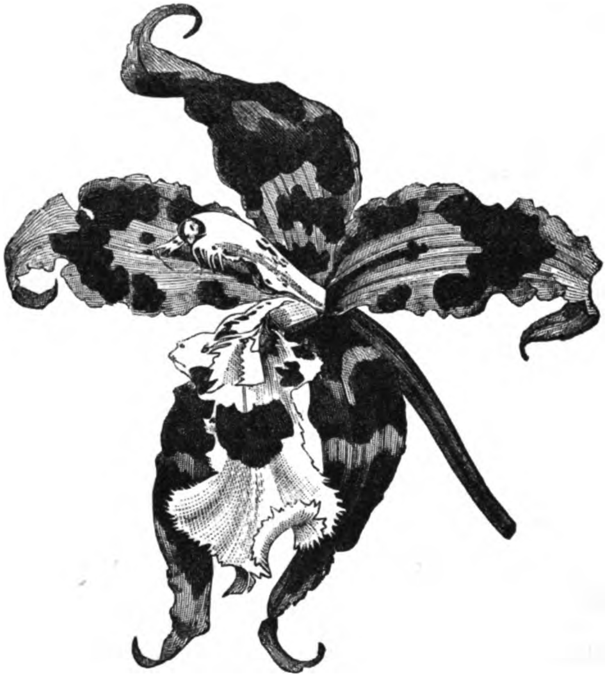
var.—Hinnus.

Sepals and petals narrower than in the commoner forms, and undulate; lip sub-rhomboidal, calli multi-dentate.

Od. luteo-purpureum Hinnus, supra. Od. Hinnus, Rchb. Xen. Orch. II. p. 153, icon. xyl. t. 160 (1861). Id. in Gard. Chron. 1871, p. 902.

var.—Mulus.

Scape sometimes branched. Sepals and petals narrower and more attenuated at the tips, the latter undulate and not toothed on the superior margin; lip panduriform, but more constricted in the middle; the bristle-like processes of the calli fewer and tooth-like.



Odontoglossum luteo-purpureum Mulus.

Od. luteo-purpureum Mulus, supra. Od. Mulus, Rchb. Xen. Orch. II. p. 151, icon. xyl. t. 160 (1868). Id. Gard. Chron. XVIII. (1882), p. 616, var. Holfordianum. Od. histrionicum, Rchb. in Gard. Chron. XVII. (1882), p. 178. Id. XVIII. (1882), p. 437.

var.—Sceptrum.

Flowers smaller with broader segments and a more regular contour; sepals chestnut-brown with a narrow border of golden yellow, and sometimes with two or more transverse yellow bars; petals golden yellow with two or three large chestnut-brown blotches on the distal half and several smaller ones on the basal half; lip yellow with a broad horse-shoe shaped chestnut-brown blotch in the front of the calli.

Odontoglossum luteo-purpureum Sceptrum, Rchb. *Illus. hort.* 1871, t. 73. Id. Xen. Orch. II. p. 194 (1874). Rchb. in Gard. Chron. XVII. (1882), p. 525.

var.—Vuylstekeanum.

Flowers somewhat smaller than the common form with the segments much more undulated; the usual chestnut-brown is here deep nankeen-yellow, and the yellow markings pale sulphur-yellow; crest deep yellow.

Od. luteo-purpureum Vuylstekeanum, supra. Od. Vuylstekeanum, Rchb. in Gard. Chron. XXII. (1884), p. 7.

Od. luteo-purpureum was discovered by M. Linden in 1842 in the forests of Quindiu, on the Central Cordillera of New Granada, at 8,000 feet elevation, from whose specimens it was described and named by Dr. Lindley in his *Orchideæ Lindenianæ.* It does not appear to have been in cultivation till it was re-discovered by Weir, in the *Od. crispum* district, while collecting Orchids for the Horticultural Society of London, and about the same time in the same district by Blunt, while on a similar mission for Messrs. Low and Co., of Clapton. Both collectors sent home living plants to their respective employers, by whom they were subsequently distributed.

Od. luteo-purpureum is distributed over a very large area of the New Granadian Odontoglossum region, inhabiting both the eastern and central Cordilleras, its vertical range on both lying between 7,000 and 9,000 feet elevation. On the eastern Cordillera it was gathered by Weir 100 miles south of Bogota, which is probably not far from its southern limit; it appears at intervals along the Cordillera to as far north as Ocaña, where an inferior variety is reported to be found in company with *Od. Pescatorei.* On the central Cordillera it extends from Quindiu to Medellin, its principal stations being at La Cega Alta and Santa Elena, situate between that town and Sonson;[*] in the vicinity of the last-named town it was observed by M. Roezl on the branches of trees forming dense tufts that produced scapes 20—24 inches long.[†] Generally speaking, the forms with broader floral segments and brighter colours come from the central, while those with narrower segments and deep colours come from the eastern Cordillera.

As a species, *Od. luteo-purpureum* is one of the most variable known,[‡]

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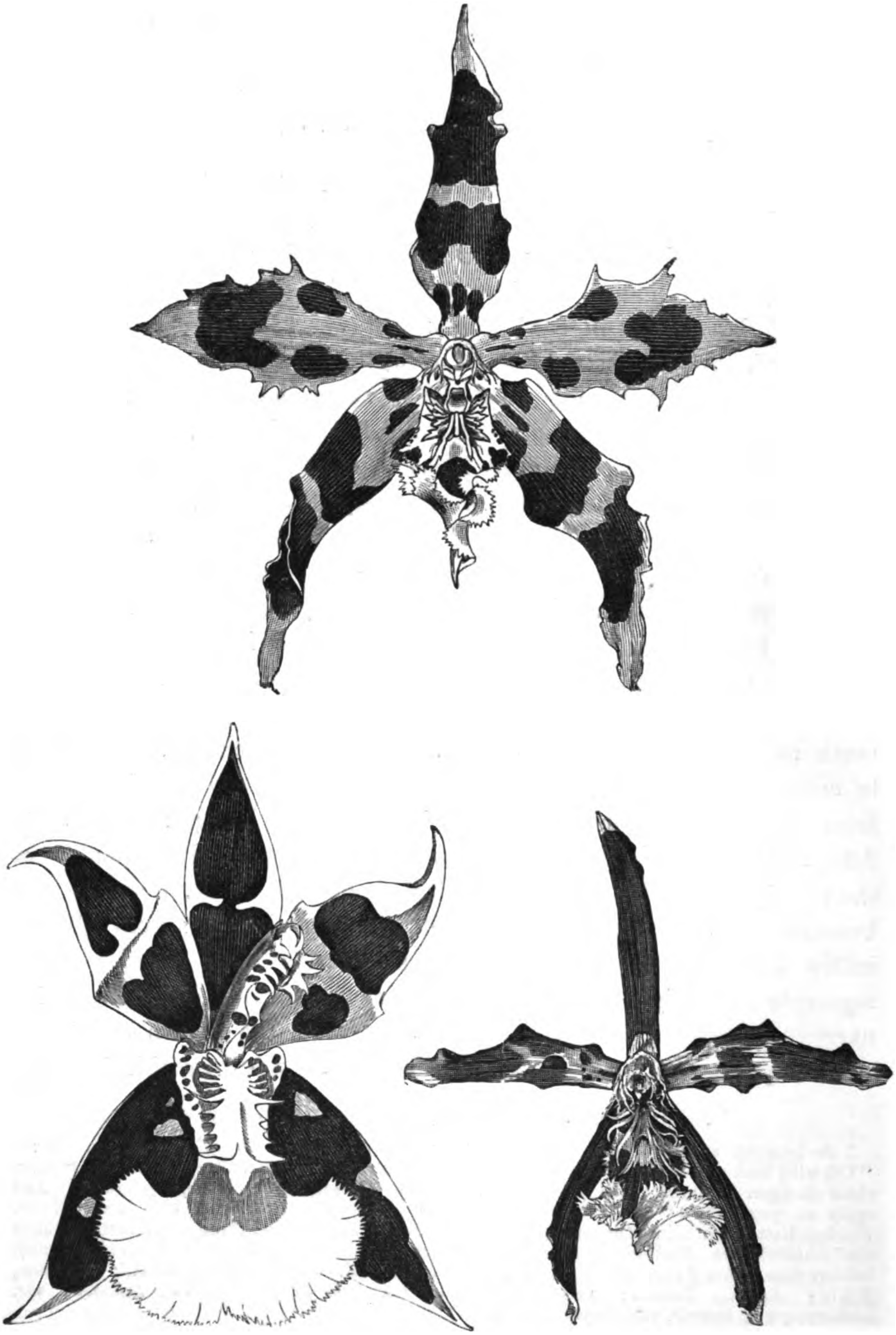
[*] Kalbreyer in lit. [†] Godefroy's Orchidophile, 1883, p, 644.

[‡] So long ago as 1868, Professor Reichenbach wrote in his *Xenia Orchidacea*, II., p. 151 :—"Oft wird man sich überzeugen müssen, dass ganze Reihen von ehemaligen Arten nur Formen einer einzigen Art sind. Ein solcher Fall liegt bei *Odontoglossum luteo-purpureum.*" And again at page 194—"Die Verwandschaft des *Od. luteo-purpureum* ist eine unheimliche. Ehedem hatten wir keine Ahnung von dem unsäglichen Formenreichthume. Neuerlich haben die massenhaften Einführungen und reichlichen Sammlungen trockner Exemplare mich belehrt dass mehre Arten mitdenselben zu vereinigen sind. *Od. Schlimii*, Lind.; *radiatum*, Rchb.; *hystrix*, Batem.; *Sceptrum*, Rchb., *Od. luteo-purpureum*, var. *Schlimii*, var. *radiatum*, var. *hystrix*, var. *Sceptrum*, &c.



Odontoglossum luteo-purpureum forms.—From the *Gardeners' Chronicle*.

a circumstance to be partly accounted for by the large area over which it is spread, together with its great diversity of station, and partly by its intermixture with other species, which has resulted not only in the production of natural hybrids, but also from them and their parents has sprung an exceedingly mixed progeny. The forms described above are among the most distinct yet introduced, but around all of them, numerous sub-varieties may be grouped deviating more or less from the original type. The most constant of these forms is *Sceptrum,* which may hereafter be restored to specific rank.[*] The variety *amplissimum* appeared in Mr. Brymer's collection at Ilsington House, near Dorchester; *cuspidatum* was gathered by Roezl, Chesterton, and other collectors; the structure of the calli indicates descent from a mule, in which *Od. odoratum* participated in the parentage; *facetum* appeared in Mr. Lee's collection in 1880; *Hinnus* was imported by Messrs. Low and Co, as was *Mulus,* and subsequently by other firms; *Sceptrum* was first sent to Europe by Wallis in 1868 to M. Linden's horticultural establishment at Ghent; *Vuylstekeanum* was exhibited for the first time by Mr. Vuylsteke, horticulturist of Ghent, at St. Petersburg, in the spring of 1884. The specific name, *luteo-purpureum* (lit. "purple with yellow"), is unfortunate, inasmuch as the flowers are invariably chestnut-brown and yellow. The dried flowers, however, which Dr. Lindley only saw, have a purplish tint, and the stains made by the brown parts of fresh flowers are decidedly purple.

Od. maculatum.

Pseudo-bulbs, leaves, and inflorescence as in *Od. cordatum,* except that the pseudo-bulbs are more crowded, and the pedicels of the flowers longer. Flowers 2—3 inches across; sepals spreading, lanceolate, keeled, brown, but sometimes with the acuminate tips yellow, and with some yellow transverse bars at the base; petals ovate-lanceolate, acute, wavy, yellow spotted with brown on the basal half; lip triangular with an acuminate apex, yellow spotted with brown; crest two-lobed, toothed. Column white.

Odontoglossum maculatum, Lex. Orch. Opusc. No. 39 (1825). Lindl. *Bot. Reg.* 1840, t. 30. Id. Fol. Orch. Od. No. 11, (1852). Linden's *Pesc.* t. 28 (1860). Batem. *Monogr. Od.* t. 20. *Bot. Mag.* t. 6455. Williams' *Orch. Alb. II.* t. 52. Od. cordatum, Paxt. *Mag. Bot. XIII.* (1847), p. 147. Od. anceps., *Illus. hort.* 157, t. 128. Od. Luddemannianum, Regel's *Gartenfl.* 1859, t. 275.

The botanical and horticultural history of *Od. maculatum* is nearly identical with that of *Od. cordatum.* It is a Mexican plant that was first made known to science in the early part of the present century by La Llave and Lexarza, who gathered it on the Irapean Mountains, near Valladolid. It was introduced to British gardens by Mr. Barker, of Birmingham, who received it from his collector, Ross, about the same time as *Od. cordatum*, but it seems soon afterwards to have disappeared from cultivation. Fifteen years later it was re-introduced by M. Linden, through Ghiesbreght. Frequent importations in late years have rendered it one of the best known of Mexican Odontoglots. It usually flowers in March and April, but it is not an uncommon occurrence for its flower spikes to be produced at other times of the year. A variety called *antennatum* is described by Reichenbach as having "a styliform tomentose process on each side of the base of the fovea."* The specific name, *maculatum*—"spotted"—refers to the spotted lip and petals.

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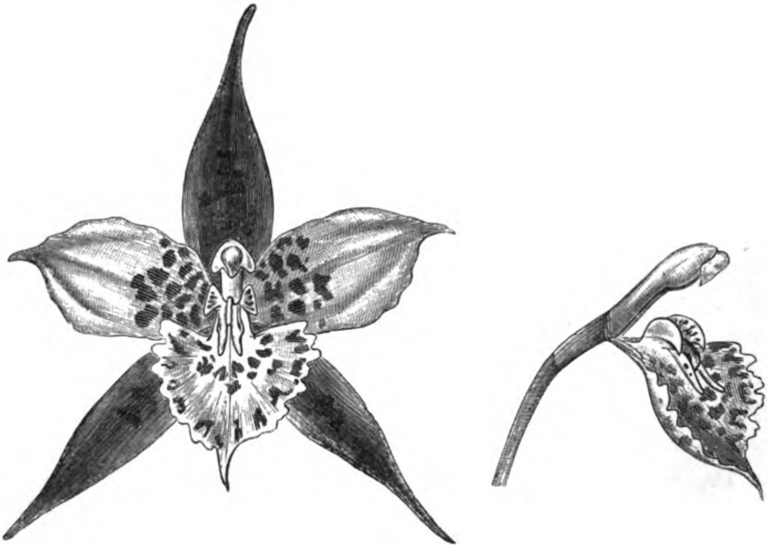
[*] "When degrading this fine thing to a variety of *luteo-purpureum,* I may have been guided by some hybrids between the two varieties or species. At all events, it well deserves to rank as a distinct Garden form."—Rchb. in Gard. Chron. XVII. (1882), p. 525.



Odontoglossum maculatum.

Od. maxillare.

Pseudo-bulbs 4—5 inches long, narrowly oblong, much compressed, diphyllous. Leaves narrowly lanceolate, 6—9 inches long, recurved. Scapes erect, as long as, or longer than the leaves, 6—8 flowered. Flowers fragrant, 2—3 inches in diameter; sepals lanceolate, acuminate, keeled

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* Gard. Chron. XV. (1881), p. 688, and XIX. (1883), p. 110.

behind, white with a purplish brown blotch at the base; petals similar but broader; lip shorter than the other segments, with a short orange-yellow claw and a white trowel-shaped blade, the former furnished with two recurved auricles and two bilobate, sometimes entire calli. Column white, wingless.

Odontoglossum maxillare, Lindl. in Bot. Reg. 1847, sub. t. 62. Id. Fol. Orch. Od. No. 23 (1852). *Bot. Mag.* t. 6144. *Fl. Mag.* n. s. t. 158. Od. madrense, Rchb. in Gard. Chron. II. (1874), p. 804. Id. VIII. (1877), p. 102. *Illus. hort.* t. 480. Williams' *Orch. Alb. II.* t. 71.

The earliest notice of this very pretty and distinct Odontoglot is by Dr. Lindley, in the *Botanical Magazine* for 1847, in which he states that he had seen but one flower, that had been communicated to him by Mr. C. B. Warner, who could give him no information of its origin, but judging from its resemblance to *Od. Cervantesii* he inferred that it was a Mexican species. Nothing more was seen or heard of it till 1872, when M. Roezl, during his last journey through Mexico, met with it on the Sierra Madre in the neighbourhood of Colima. M. Roezl's discovery was, however, considered by Professor Reichenbach not to be referable to Lindley's *Od. maxillare,* but a new species, which he named *Od. madrense.** The plants collected by M. Roezl were acquired by us and subsequently distributed; among the first to flower was one in the collection of Mr. E. Wrigley, at Broadoaks, near Bury, Lancashire, and one at Chatsworth, which had been brought there by the late lamented Lord Frederick Cavendish; both flowered in the autumn of 1874.

There is a plant in the collection of Mr. Vanner, at Camden Wood, Chislehurst, worthy of special notice on account of its robust habit, and which produces spikes of flowers that are fully half as large again as those of the usual type.

Od. nævium.

Pseudo-bulbs ovoid, compressed, 2—3 inches long, diphyllous. Leaves linear-lanceolate, 12—15 inches long. Scapes slender, nodding, as long as, or longer than the leaves, racemose, many-flowered. Flowers 2½—3 inches across, white spotted with deep reddish purple; sepals and petals

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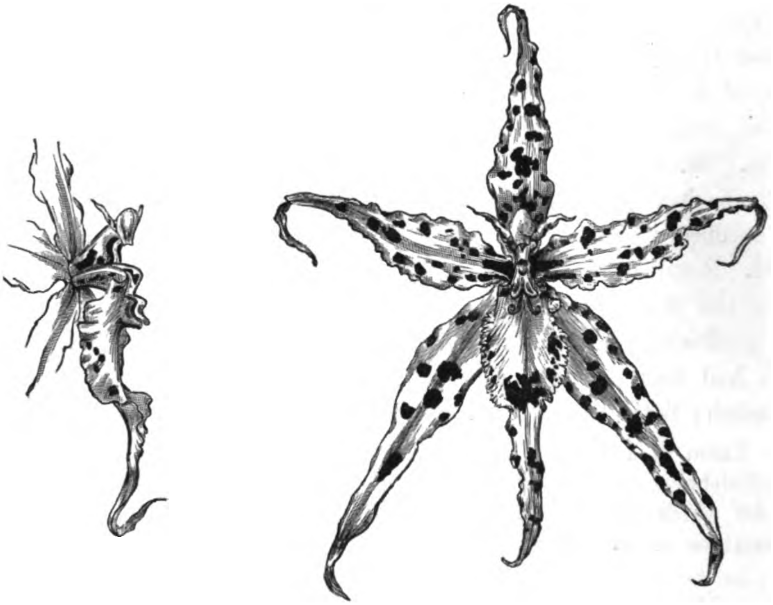
* The following is Dr. Lindley's diagnosis of the flower sent to him by Mr. Warner. "Sepalis lanceolatis acutis petalisque latioribusque sanguineo maculatis, labello ovato acuto integro, basi maculato appendice unguis maximâ altè cancavâ carnosâ glabrâ luteâ anticè bidentatâ bilamellatâ, columnæ apteræ fere longitudine." To this is added a note in English, in which he says, "it (the flower) is readily known by its wingless column, and especially by the very large size of the yellow appendage seated at the base of the lip, which is scarcely shorter than the column. The flowers are pure white, with rich crimson spots at the base of all the *six* parts." Although not completely agreeing with our present subject, it certainly fits it better than any other Mexican Odontoglot in cultivation.

similar, ovate-lanceolate, wavy, tapering to a reflexed point; lip of nearly the same form as the other segments, but a little shorter; crest with four unequal lobes, bright yellow. Column with two awl-shaped cirri at the apex, white spotted with chestnut-brown.

Odontoglossum nævium, Lindl. in Paxt. *Fl. Gard. I.* t. 98 (1850). Id. Fol. Orch. Od. No. 3 (1852). Van Houtte, *Fl. des Serres, VI.* p. 191 (1850). Linden's *Pesc.* t. 13 (1860). . Warner's *Sel. Orch. I.* t. 7 (1862-5). Regel's *Gartenfl.* 1874, t. 791. Batem. *Monogr. Od.* t. 9.

Discovered by M. Linden, in 1842, in the province of Pamplona (now Estado Santander), New Granada, at an altitude of about 8,000 feet, and re-discovered some years afterwards by Funck and Schlim, in the Venezuelian province of Truxillo, near San Lazaro and La Peña, at about 6,500 feet elevation, and again, still later, by Schlim on the mountains of Santa Marta, in the north-east of New Granada. It was introduced to M. Linden's horticultural establishment at Brussels by Funck, whence it became distributed among the Orchid collections of Europe.* It is still a very rare plant, usually flowering in April and May. The specific name, *nævium*, "marked," refers to the spotted flowers.



Odontoglossum nævium.

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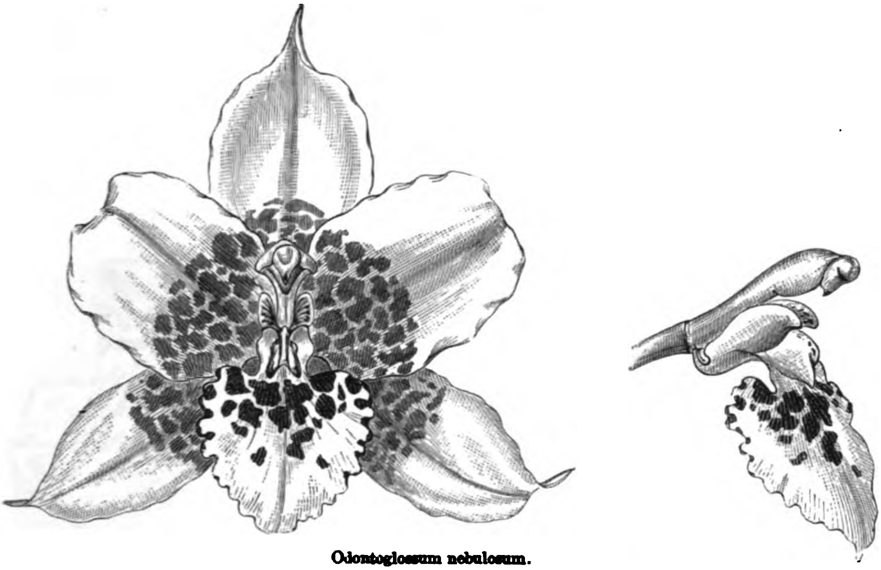
* Pescatorea, sub. t. 13.

Od. nebulosum.

Pseudo-bulbs ovoid, compressed, 3—4 inches long, diphyllous. Leaves broadly lanceolate, 7—9 inches long. Scapes stoutish, as long as the leaves, erect, or slightly nodding, 5—7 flowered. Flowers 2½—3 inches in diameter, white with the central part spotted with red-brown, the yellow crest of the lip also spotted similarly; sepals oblong, keeled behind; petals broader, oval-oblong, waved at the margin; lip with a broad claw, on which is a two-lobed crest with two pointed teeth in front; blade sub-orbicular with erose margin. Column arched, not winged, white.



Odontoglossum nebulosum.

Odontoglossum nebulosum, Lindl. Sert. Orch. sub. t. 25 (1838). Id. Fol. Orch. Od. No. 21 (1852). Rchb. in *Gard. Chron.* 1867, p. 572. Batem. *Monogr. Od.* t. 1 (1874). Od. maxillare, *Illus. hort.* 1859, t. 200.

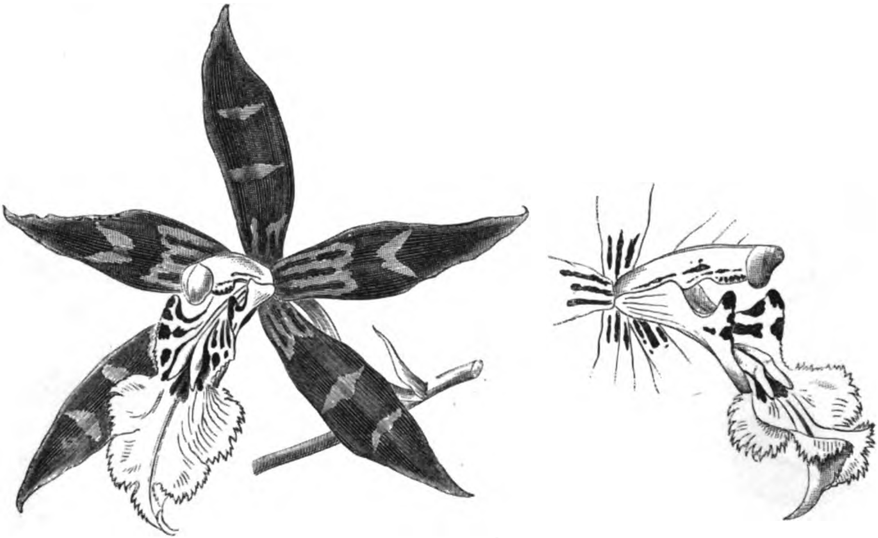
Sub-vars.—*candidissimum*, spots absent; *pardinum*, spots spread over two-thirds of the surface of all the segments.

First gathered by Baron Karwinsky, in 1833, near Oaxaca, in Mexico, and four years later received by Mr. Bateman from the same locality; but the plants perished soon afterwards from the excessive heat maintained in the house in which they were kept.* It was afterwards found by Galeotti, and still later by Ghiesbreght, who sent plants to M. Linden's establishment at Brussels, where they flowered in 1856. *Od. nebulosum* usually flowers in May and June; the colour of the spots is found to vary in different plants from deep red-brown to pale green.

* Monogr. sub. t. 1.

Od. nevadense.

Pseudo-bulbs ovoid, compressed, 3—4 inches long, diphyllous. Leaves ensiform, 10—12 inches long. Scapes slender, longer than the leaves, nodding, bearing 12—15 flowers. Flowers 2½—3½ inches across; sepals and petals sub-equal, lanceolate, acuminate, cinnamon-brown, margined with yellow, and sometimes with some yellow longitudinal stripes at their base; lip three-lobed, the two lateral lobes erect, crescent-shaped, white, striped with chestnut-brown; middle lobe hastate, acuminate, with a fringed margin, white or pale straw yellow; crest bilamellate. Column auriculate, white spotted with brown.



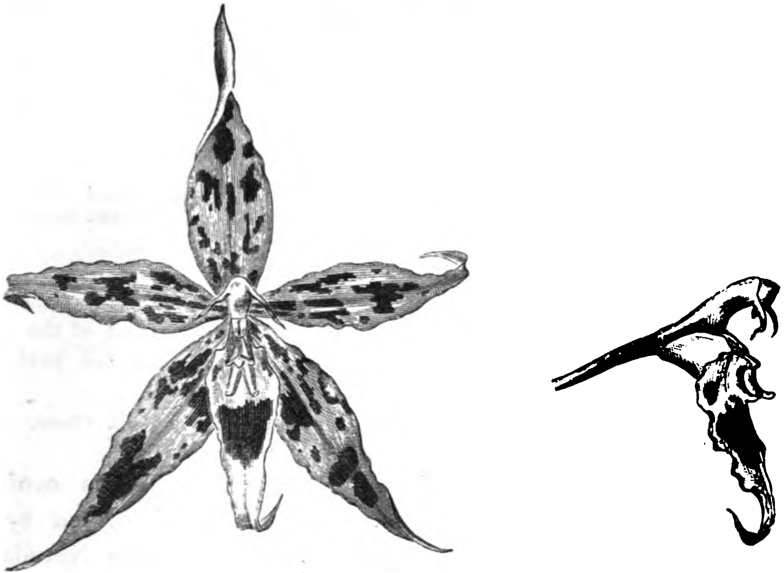
Odontoglossum nevadense.

Odontoglossum nevadense, Rchb. Xen. Orch. II. p. 206, t. 191, (1874). Id. Gard. Chron. XV. (1881), p. 136. *Illus. hort.* 1870, t. 45. Williams' *Orch. Alb. III.* t. 131.

A rare species, first sent by Gustav Wallis to M. Linden's establishment at Ghent in 1868. Wallis had collected it, unknown to himself at the time, with a number of plants of *Od. Wallisii* which he had discovered on the Sierra Nevada, near Merida, in Venezuela. It is said that only four plants were sent to Europe in the first consignment, one of which was acquired by Mr. S. Mendel, of Manchester, in whose collection it soon after flowered, being the first to flower in England. As a species, *Od. nevadense* is variable, the deviations from the type being observable chiefly in the colours and markings of the floral segments.

Od. odoratum.

Pseudo-bulbs and leaves as in *Od. crispum.* Inflorescence variable, usually a loosely branched panicle, 20 – 30 inches long, in which the rachides become zigzag towards the extremities, but sometimes much shorter and simply racemose. Flowers with a pleasant hawthorn fragrance, 1½—2 inches in diameter, varying in colour from a deep honey-yellow to pale straw-yellow, always more or less spotted with reddish brown;[*] sepals and petals similar, narrowly lanceolate, tapering to a sharp reflexed point; lip three-lobed, the lateral lobes rotund, erect; middle lobe broadly subulate, narrowed to a fine recurved point; calli two, bidendate, usually white or pale yellow. Column with two small cirri at the apex and a small auricle on each side of the stigmatic cavity.



Odontoglossum odoratum.

Odontoglossum odoratum, Lindl. Orch. Lind. p. 16. Id. Fol. Orch. Od. No. 4 (1852). *Illus. hort.* 1870, t. 39, var. latimaculatum. Rchb. in Gard. Chron. 1872, p. 667, var. striatum. *Bot. Mag.* t. 6502. Od. gloriosum, Rchb. in Bonpl. II. p. 278, et Walp. Ann. VI. p. 826 (1861). Batem. *Monogr. Od.* t. XII. (1874). Od. nævium majus, Lindl. Fol. Orch. Od. p. 3 (1852).[†]

var.—baphicanthum.

Sepals and petals canary-yellow, sometimes paler, with 1—5 chestnut-brown spots on each; lip similar, the bifurcate crest of a deeper yellow, with a few red streaks.

Od. odoratum baphicanthum, supra. Od. baphicanthum, Rchb. in Gard. Chron. VI. (1876), p. 260. Id. XIX. (1883), p. 310.

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[*] Horticulturists sometimes distinguish the deep-coloured forms, which come chiefly from the Merida district, as *odoratum*, and the pale ones as *gloriosum*, the difference in the vast majority of instances being that of colour only.

[†] *Odontoglossum præstans* (Rchb. in Gard. Chron. IV. (1875), p. 323), not seen by us, would seem to be one of the forms of this very polymorphous species.

var.—deltoglossum.

Flowers larger and of brighter colours; lip deltoid, apiculate, margin dentate; crest of a deeper yellow, in front of which is a large reddish blotch.

Od. odoratum deltoglossum, supra. Od. deltoglossum, Rchb. in Gard. Chron. XV. (1881), p. 202. Od. Brassia, Rchb. in Gard. Chron. XXIII. (1885), p. 501.

var.—hebraicum.

Flowers pale yellow with reddish brown spots on the sepals, and markings on the petals having a fancied resemblance to the Hebrew characters; lip deeper yellow at the base, the thickened side lobes streaked with red.

Od. odoratum hebraicum, supra. Od. hebraicum, Rchb. in Gard. Chron. XI. (1879), p. 462. Williams' *Orch. Alb. V.* t. 194. *Id. II.* t. 85. (var. lineoligerum, which is more copiously spotted than the original hebraicum).

var.—Leeanum.

Flowers larger, with broader segments that are more richly coloured; the lip is conspicuous by its large red-brown blotch in front of the crest, and its bright yellow margin, on which are sometimes a few red-brown spots.

Od. odoratum Leeanum, supra. Od. Leeanum, Rchb. in Gard. Chron. XVII. (1882), p. 523. Williams' *Orch. Alb. III.* t. 101.

The botanical history of *Od. odoratum*, owing to its confused synonymy, is somewhat complicated. It was first discovered by M. Linden in 1842—3, in the humid forests on the Sierra Nevada of Merida, in western Venezula, at 5,000—7,000 feet elevation;* it was afterwards gathered by Schlim in the oak forests on the eastern Cordillera of New Granada, in the province of Soto, at 8,000—9,000 feet elevation,† from whose specimens it was described by Reichenbach, under the name of *Od. gloriosum*.‡ It was also found by Wagener, in the neighbourhood of Ocaña, and, according to the *Illustration horticole loc. cit. supra,* by the same traveller near Caracas.§ The first living plants reached this country in 1863, through the exertions of Blunt, while collecting Orchids for Messrs. Low and Co., and about the same time through Weir, while on a similar mission for the Horticultural Society of London, both of whom met with it in the *Od. crispum* district around Bogota. Kalbreyer informs us that it is also found by itself beyond the limits of the *Od. crispum* range, both in an easterly and westerly direction from Bogota, especially at Las Manzanas, Alto de Bobele, &c. The range of *Od. odoratum* being thus very great, extending along the eastern Cordillera, from the third to the eighth parallel of north latitude, it is not surprising that from this cause alone it should be a very variable species.

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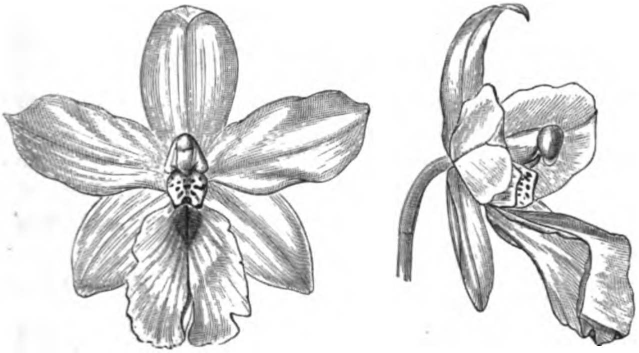
* Lindley in Orch. Lind. No. 86, p. 16. † Rchb. in Walp. Ann. VI. p. 826.

‡ Professor Reichenbach writes in the *Gardeners' Chronicle* for 1870, p. 104. "We believe *Od. gloriosum* in its typical form to be widely different from *Od. odoratum*, showing different colours and "cirri," and a different callus; yet we are suspicious that among the small-flowered varieties there may be some which are nothing else than a white variety of *Od. odoratum*."

§ The presence of *Od. odoratum* in this locality, we think, requires confirmation.

The variety *baphicanthum* originally appeared in one of our own importations, as did *deltoglossum; hebraicum* was introduced by Mr. William Bull; and *Leeanum,* also introduced by us, is represented by a unique plant in Mr. Lee's collection at Downside. All these forms are of supposed hybrid origin.



Odontoglossum Oërstedii.

Od. Oërstedii.

A dwarf plant. Pseudo-bulbs about the size of a large walnut, compressed, bearing a single stalked, elliptic-lanceolate leaf 3—5 inches long. Scapes longer than the leaves, 2—5 flowered. Flowers 1—1½ inches in diameter, white except the yellow base of the lip; sepals and petals similar, oblong, spreading; lip with two small lateral lobes and a large sub-orbicular middle one having a deep cleft in the anterior edge; crest with two lateral erect lamellæ on a raised quadrangular yellow callus spotted with orange. Column white.

Odontoglossum Oërstedii, Rchb. in Bonpl. III. p. 214 (1855). Id. Xen. Orch. I. p. 189 (1856). Id. Gard. Chron. VII. (1877), p. 302. *The Garden, XXVI.* (1884) t. 454. *Bot. Mag.* t. 6820.

Native of the highest slopes and crests, at 7,000—9,000 feet elevation, of Irasu and Turialba, in Costa Rica, where it was discovered, in 1848, by Warscewicz, a sketch of an Odontoglot, made by him being believed by Professor Reichenbach to be referable to this plant. It was afterwards found by Dr. Oërsted, whose name it perpetuates, and later by Kramer and Endres. It was introduced by us through the last-named collector, in 1872, and flowered for the first time in England, in our Chelsea Nursery, in the spring of the following year.

Cultural Note.—On its native mountains *Od. Oërstedii* is found on dwarf moss-covered trees, exposed all the year round to frequent tempests, and to a low temperature at night. At this altitude, dense fogs occur daily, which keep the moss amongst which it grows constantly moist.* Hence, like all dwarf Odontoglots, this species is best cultivated in shallow pans suspended near the roof-glass, where it can receive the maximum of light and range of temperature, care being taken to keep the surface moss always moist.

Od. pardinum.

Pseudo-bulbs ovate, 2—3 inches long, compressed, mono-diphyllous. Leaves elliptic-oblong, 6—8 inches long. Scapes erect, 24—36 inches long, dull pale purple, paniculate. Flowers 2 inches in diameter, lemon-yellow with some reddish brown spots on the petals and lip; sepals lanceolate, undulate; petals shorter, broader, and more undulate; lip with a short claw, subpanduriform, acute; crest consisting of two lateral erect toothed lobes, the two anterior teeth larger and more prominent than the others. Column not winged.

Odontoglossum pardinum, Lindl. Sert. Orch. sub. t. 25 (1838.) Id. Fol. Orch. Od. No. 49 (1852). *Bot. Mag.* t. 5993.

One of the discoveries of Dr. Jameson, for many years Professor of Botany and Chemistry in the University of Quito. The specimens sent by him to Sir William Hooker were gathered on Sara Urcu, a volcanic mountain a little to the east of Quito. It was afterwards collected by Hartweg, at Popayan, in southern New Granada.† It does not appear to have been introduced in a living state till many years afterwards, one of the earliest notices of its flowering in this country being in Messrs. Backhouse's nursery at York, in 1867.‡

Od. Pescatorei.

Pseudo-bulbs ovoid, compressed, smooth with rounded edges, 3—4 inches long, diphyllous. Leaves ligulate, pointed, 8—12 inches long. Scapes slender, arching, 18—24 inches long, sometimes racemose, but not infrequently branched at the basal end of the rachis. Flowers

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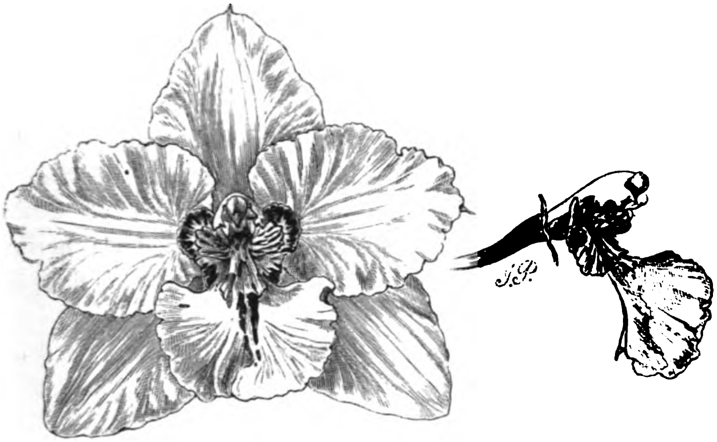
* R. Pfau in Gard. Chron. XX. (1883) p. 658.

† Lindl. Fol. Orch. Od. No. 49.

‡ Bot. Mag. sub. t. 5993.

2—3 inches in diameter, usually white, except the bright golden yellow crest of lip, but sometimes stained with pale rosy purple;* sepals elliptic-oblong, smooth, with entire edge; petals broader, undulate; lip panduriform, emarginate with an apiculus at the base of the cleft, edge erose, the side lobes rotund, spotted with purple; crest expanded into two dentate lobes streaked with red and prolonged in front into two diverging teeth. Column with two broad truncate wings, white spotted with brown.



Odontoglossum Pescatorei.

Odontoglossum Pescatorei, Linden in *Paxt. Fl. Gard. II.* t. 90 (1852-3). Id. *Pesc.* t. 1. 1860. Lindl. Fol. Orch. Od. No. 56 (1852). *Fl. Mag. IV.* t. 241. Warner's *Sel. Orch. I.* t. 25 (1864-5). Van Houtte, *Fl. des Serres, XVI.* t. 1624. Batem. *Monogr. Od.* t. 5. Regel's *Gartenfl.* 1875, t. 835. Williams' *Orch. Alb. IV.* t. 175.

Veitch's variety.—*See Frontispiece.*

Inflorescence panicled; flowers larger and more symmetrical than in the commoner forms; all the segments irregularly blotched with rich magenta-purple, the portion so coloured occupying more than one-half of the entire surface.†

Od. Pescatorei Veitchianum, Rchb. in Gard. Chron. XVII. (1882), p. 588. Williams' *Orch. Alb. II.* t. 68. *The Garden, XXVI.* (1884), t. 452.

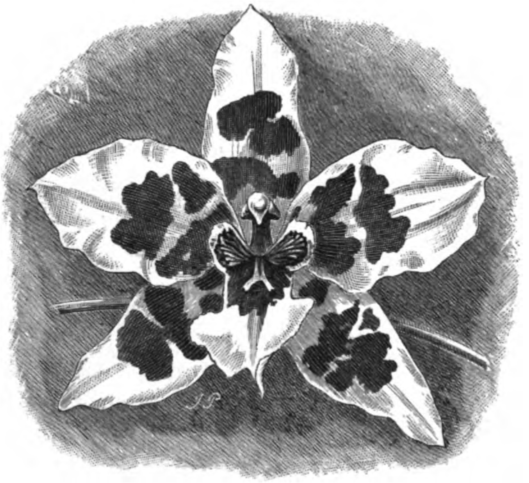
* The coloration is very variable; sometimes the sepals and petals are washed or streaked with delicate rose colour, and on the blade of the lip, immediately in front of the crest, there is frequently a purple spot; much more rarely the segments are pale yellow, and still more so they are blotched with the richest purple on a white ground.

† In this variety we have a remarkable instance of the change in the form of the colouration that takes place in the flowers of the same plant in different seasons, a peculiarity especially noticeable among Odontoglots. On the first occasion on which *Veitch's* variety flowered in this country, the coloured portion of the flower took the form of two concentric uninterrupted zones, arranged somewhat similar to the tangential streaks in *Od. Cervantesii.* As the plant gained strength under the skilful treatment of Mr. Ballantine, Baron Schroeder's gardener, the magenta-purple bands developed into the large irregular blotches as represented in the woodcut.

With this may be grouped Baron Schroeder's variety (Rchb. Gard. Chron. XX. (1883), p. 588); Sir Trevor Lawrence's (Hort.); Low's (Rchb. in Gard. Chron. XXI. (1884), p. 638); Thomson's (Hort.); and Vervaet's (Hort.), all differing more or less from Veitch's, and *inter se* in the form and extent of the blotches on the floral segments.

Other colour or sub-varieties have been named *aurantiacum* (Gard. Chron. XIX. (1883), p. 532); *flaveolum* (Id. XVII. (1882), p. 331); *limbosum* (Id. XIII. (1880), p. 169); *maculatum* (Id. XVII. (1882), p. 182); *purpuratum*, *roseum*, *superbum*, *violaceum*, &c.

Od. Pescatorei was discovered by Funck and Schlim in 1847 in the oak forests that cover the higher declivities of the eastern Cordillera of New Granada, in the neighbourhood of Ocaña. It was introduced by them shortly afterwards to M. Linden's horticultural establishment at Brussels, where it flowered for the first time in Europe in 1851.* For many years afterwards it continued to be very rare in European collections, partly from faulty cultural treatment and partly from the difficulty at first experienced in importing it alive. Its habitat is on one of the north-west branches of the Cordillera, where it is spread over an area of about 30 square leagues, being very abundant on the Sierra Palado and the Alta Santa Rosa, and in some other localities,† its vertical range being 6,000—9,000 feet. Veitch's



Odontoglossum Pescatorei.—Veitch's variety.

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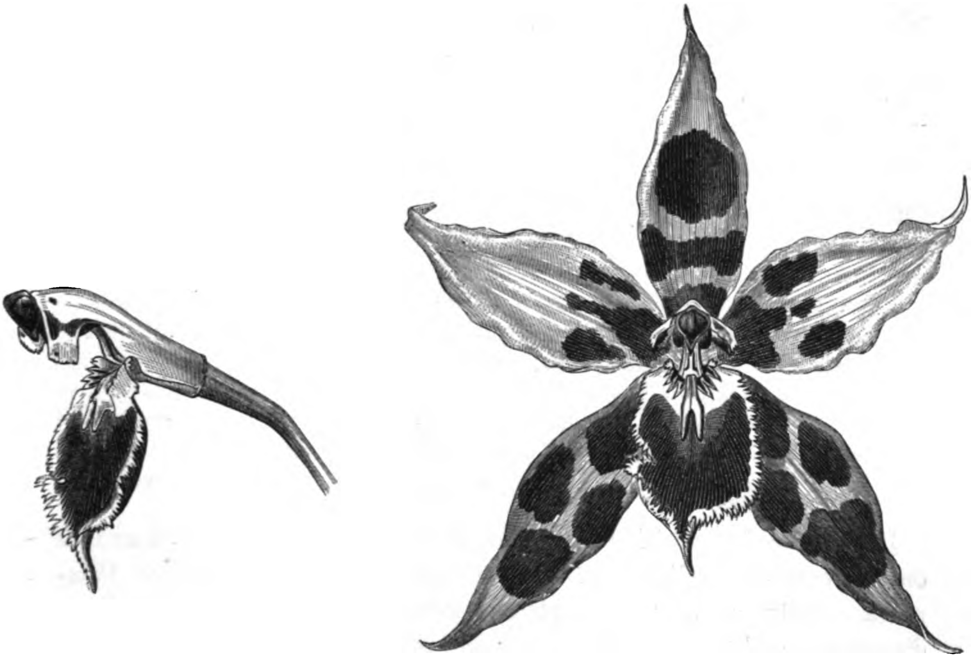
* Linden's Pescatorea, sub., t. I.

† Kalbreyer *in lit.*, who informs us that although he found it growing on the stems and principal branches of trees; he never saw it on the evergreen oaks that abound in that region.

variety appeared among one of our own importations, as did Sir T. Lawrence's; Baron Schroeder's was imported by Messrs. Sander and Co., and Low's by Messrs. Low and Co.* Thomson's was exhibited at the Orchid Conference, held at South Kensington in May, 1885, by Messrs. Thomson and Sons, of Clovenfords, near Galashiels. All of these forms exist at present as unique plants.

Od. Pescatorei may not be inaptly compared with *Od. crispum*, to which it has a great resemblance, but from which it may always be distinguished by its broad sub-orbicular lip, its oval sepals and petals, and the truncate wings of its column. It was dedicated to M. Pescatore, a wealthy Parisian banker, who possessed at the time of its introduction one of the most extensive and varied collections of Orchids on the Continent. The usual flowering season of established plants of *Od. Pescatorei* is from March to May.



Odontoglossum polyxanthum.

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[*] Veitch's and Baron Schroeder's varieties are now in the collection of the last-named gentleman at The Dell, and Sir T. Lawrence's and Low's are in Sir Trevor's collection at Burford Lodge.

Od. polyxanthum.

Pseudo-bulbs sub-pyriform, compressed, 3—4 inches long, diphyllous. Leaves linear-lanceolate, 12—15 inches long. Scapes as long again as the leaves, racemose. Flowers 3 inches in diameter; sepals and petals ovate-lanceolate, acute, lemon-yellow blotched with cinnamon-brown, the blotches on the petals smaller than those on the sepals, and confined to the basal end;* lip oblong with dentate margin, apiculate, cinnamon-brown bordered with pale yellow; crest consisting of two white dentate lamellæ, terminating in two projecting teeth. Column with two quadrate, toothed wings, white, blotched with brown.

Odontoglossum polyxanthum, Rchb. MS. *Floral Mag.* n. s. t. 453 (1881). Gard. Chron. XVI. (1881), p. 460, icon. xyl. Williams' *Orch. Alb. VI.* t. 258.

Discovered by Edward Klaboch, in 1877, on the Andes of Ecuador, where it is said to be quite rare. It flowered for the first time in this country in the collection of Mr. Walter Cobb, at Silverdale, Sydenham, in April, 1880. The specific name, from πολὺ (poly), "much" or "very," and ξανθὸς (xanthos), "yellow," refers to the bright yellow colour of the flowers.

Od. prænitens.

Pseudo-bulbs narrowly oblong, 2—3 inches long, diphyllous. Leaves linear-oblanceolate, acute, 6—9 inches long. Scapes nodding, racemose, 8—10 flowered. Flowers 2—3 inches in diameter, bright yellow with large irregular chestnut-brown blotches on all the segments; sepals and petals elliptic-lanceolate, acute, undulate; lip clawed, with an orbicular-reniform, crumpled blade, toothed at the margin, paler in colour than the other segments, and having at its base a pair of horned calli and two toothed lamellæ. Column with short broad auricles.

Odontoglossum prænitens, Rchb. in Gard. Chron. III. (1875), p. 524. *Bot. Mag.* t. 6229.

Introduced by us in 1874, through Gustav Wallis, who found it on the eastern Cordillera of New Granada, in the province of Pamplona. Only a very few plants were received by us from its discoverer, and as we are not aware of its having been imported since, it is doubtless a rare species, if species it is.†

Od. pulchellum.

Pseudo-bulbs oblong, 3 inches long, compressed with acute edges, di-triphyllous. Leaves grass-like, stiffish, linear, a foot long. Scapes as long as the leaves, flattened, with a small sheathing bract at each joint, and bearing a 5—10 flowered raceme at its upper extremity. Flowers white except the yellow fleshy disc of the lip; sepals and petals similar, oval, apiculate; lip three-lobed, the side lobes triangular, the intermediate one oblong, reflexed; crest three-lobed on the basal side, horse-shoe shaped in front. Column short and thick, winged.

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* In the best types, the upper sepal has a large circular central blotch of cinnamon-brown and two or three broad transverse blotches below it; the lateral sepals have each four or five large blotches; the petals, which are somewhat broader than the sepals, have three or four small blotches at the base.

† Most of the plants in cultivation under the name of *Od. prænitens* are referable to *Od. facetum*, Rchb.

Odontoglossum pulchellum, Batem. in *Bot. Reg.* 1841, t. 48. *Bot. Mag.* t. 4104. Lindl. Fol. Orch. Od. No. 63. Warner's *Sel. Orch. II.* t. 13. Od. Egertonii, Lindl. Bot. Reg. 1845, misc. p. 50.

One of the earliest discoveries of Mr. G. Ure Skinner in Guatemala, and sent by him to Mr. Bateman in 1840, in whose collection at Knypersley, in Cheshire, it flowered for the first time in this country in February of the following year. For many years it appears to have been a rare plant in European gardens, and even at the present time it is by no means plentiful. There are two well-marked forms, distinguished from each other by the size of their flowers; the larger flowered variety is known as *majus* or *grandiflorum*; the smaller, sometimes called *Od. Egertonii*, is evidently a local, probably an alpine form, whose habitat has not been recorded. In both forms, owing to the erect position of the raceme, the flowers appear to the spectator to be inverted; that is, the labellum, usually the lowermost segment when the rachis is nodding or pendulous, is in this case the uppermost. It is a very distinct Odontoglot, of which its specific name, *pulchellum*, "pretty," is an appropriate designation; its attractiveness is further enhanced by the pleasant hyacinth fragrance of the flowers, which are produced in the spring months, usually from February to April.

Od. ramosissimum.

Pseudo-bulbs oval-oblong, compressed, ancipitous, bearing a single linear-lanceolate leaf 12—15 inches long. Scapes erect, branched, 2 feet high and upwards. Flowers 2 inches in diameter, white spotted with mauve-purple; sepals and petals nearly equal, narrowly lanceolate, acuminate, with undulate margin and reflexed tips; lip elongated, deltoid, acuminate, reflexed; crest bilamellate, many-toothed in front. Column winged, white stained with mauve-purple.

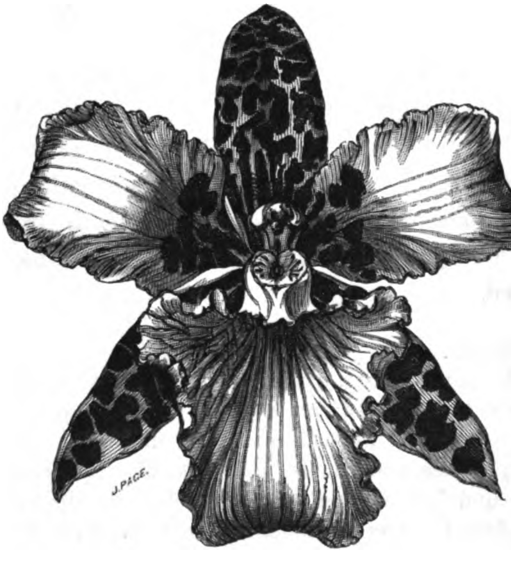
Odontoglossum ramosissimum, Lindl. Fol. Orch. Od. No. 47 (1852); Rchb. in Gard. Chron. III. (1875), p. 396. Od. angustatum, Batem. *Monogr. Od.* t. 26.

var.—liliiflorum.

More robust in all its parts. Flowers larger, pale rose-purple with some white ocellated spots on the basal half of the sepals and petals, the margins of which are less undulate than in the type.

Od. ramosissimum liliiflorum, supra. Od. liliiflorum, Hort.

First discovered by Linden, in 1843, "in the thick forests in the neighbourhood of Merida, at the height of 6,500 feet";* but not introduced till 1871, in which year Gustav Wallis sent plants to M. Linden's establishment at Ghent. It has always been a rare species in gardens, and has occasionally been confounded with *Od. angustatum*,† a Peruvian species discovered earlier in the century by Col. Hall; it is also a variable one as regards the colour and spotting of the flowers. The variety *liliiflorum*, a very distinct and, at the same time, a very rare plant, was first introduced from New Granada many years ago by Messrs. Rollisson, of Tooting. There is also a sub-variety called *xanthinum* in Sir Trevor Lawrence's collection at Burford Lodge, in which the white of the flower is replaced by canary-yellow. Although the individual flowers of *Od. ramosissimum* are not striking, the *ensemble* of the inflorescence, which is usually produced in March and April, is very attractive.



Odontoglossum Roezii rubescens.

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* In M. Godefroy's Orchidophile for May, 1883, M. Roezl states that he found this Odontoglot on the central Cordillera, near Manizal (?), at 12,000—13,000 feet elevation, where the temperature at night sinks to a few degrees below the freezing point, while in the daytime it ascends to 11° and 12° C. (52—54° F.).

† "A narrow spider-like thing, easily recognised by the narrow base of the lip; it has a poor inflorescence of tiny flowers." Rchb. in Gard. Chron. III. (1875), p. 396. *Od. angustatum* has yellow and brown flowers.

Od. Rossii.

Pseudo-bulbs ovoid, compressed, monophyllous. Leaves oblong-lanceolate, about 4 inches long. Scape 6—8 or more inches long, with a sheathing bract at each joint and at the base of each pedicel, 2—5 flowered. Flowers 2—3 inches in diameter, very variable in colour, usually white or pale rose-purple with the sepals spotted all over, the petals at the base only and the lip without spots; sepals lanceolate, acuminate; petals broader, ovate-oblong; lip clawed with a variable blade which is broadly cordate, reniform, or sub-orbicular, margin crisped and erose; crest concave, prolonged to the base along the upturned laciniæ of the claw, bright yellow with a few red streaks on the concave surface. Column wingless.

Odontoglossum Rossii,* Lindl. Sert. Orch. sub. t. 25 (1838). *Bot. Reg.* 1839, t. 4. Fol. Orch. Od. No. 20. Warner's *Sel. Orch. III.* t. 15. Van Houtte's *Fl. des Serres* (1874), t. 2110. Sander's *Reichenbachia*, t. 4, var. majus. *The Garden, XXVIII.* (1885), t. 507. Od. rubescens, Lindl. Jour. Hort. Soc. V. p. 35. Od. cærulescens, A. Rich. fide Rchb. in Gard. Chron. XI. (1879), p. 138. Od. Dawsonianum, Rchb. Gard. Chron. 1865, p. 1226. Od. acuminatum, Hort.

var.—asperum.

Flowers pale primrose-yellow with the spots chestnut-brown; crest of lip orange streaked with red. Column purplish.

Od. Rossii aspersum, supra. Od. aspersum, Rchb. in Gard. Chron. XI. (1879), p. 266. Williams' *Orch. Alb. VI.* t. 245.

var.—Ehrenbergii.

Scape 2—3 flowered; flowers smaller with more acute segments; sepals and base of petals pale green spotted with chestnut-brown.

Od. Rossii Ehrenbergii supra. Od. Ehrenbergii, Lindl. Fol. Orch. Od. No. 19. *Illus. hort. I.* t. 30. Od. Dawsonianum, Hort.

var.—Humeanum.

Flowers with narrower and more acute segments, except the lip, which is broadly cordate; sepals yellow barred with cinnamon-red; petals white with some brown blotches at the base.

Od. Rossii Humeanum, supra. Od. Humeanum, Rchb. in Gard. Chron. V. (1876), p. 170.

var.—Warnerianum.

Pseudo-bulbs elongated. Scapes 2—3 flowered. Flowers white, except the basal half of the sepals and petals, which are greenish barred with reddish brown.

Od. Rossii Warnerianum, supra. Od. Warnerianum, Rchb. in Gard. Chron. 1865, p. 579. Batem. *Monogr. Od.* t. 13. Warner's *Sel. Orch. II.* t. 20.

Among the numerous colour or sub-varieties the following are distinct types: (1) Flowers white with the spots brown, the earliest introduced form; (2) *cærulescens*, flowers rosy mauve with the spots purple; (3) *rubescens*, flowers pale rose with the spots reddish brown; (4) *virescens*, flowers white with the spots green.

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* Mr. Hemsley, in *Biologia Cent. Am.* pars. XVI. p. 274, has referred this species to the *Od. apterum* of La Llave and Lexarza (Orch. Mex. II. 35, et Orch. Opus. No. 38), and we think rightly. It is not very probable that such careful observers would have passed over one of the most generally distributed Orchids of their adopted country. See Lindl. Fol. Orch. No. 24.

Od. Rossii was introduced in 1837 by Mr. Barker, of Birmingham, through Ross, while on a mission to Mexico for the purpose of collecting Orchids in that country, and who gathered it in the Oaxaca district. It is now known to be widely distributed over the Mexican plateau from the 20th parallel of N. latitude, southwards as far as Nicaragua, and many localities are recorded in which it has been gathered by different collectors, which partly accounts for the great variability of the species. M. Roezl met with it growing in great profusion on stunted oaks on the verge of the plateau, near the main road from Orizaba to Mexico, and expresses his surprise at the numerous varieties into which it had sported even in that one spot.* The variety *aspersum* first appeared in one of our own importations in 1879, and is supposed to be of hybrid origin, deriving its yellow colour from *Od. maculatum*; *Ehrenbergii* is a diminutive form that was first introduced more than thirty years ago; *Humeanum* is also of supposed hybrid origin, deriving its cordate lip and cinnamon-red spots from *Od. cordatum*;† *Warnerianum* is a very distinct form, probably of hybrid origin, that appeared in the collection of Mr. Warner, at Broomfield, near Chelmsford, in 1865. *Od. Rossii* and its varieties flower in their native country and in the glass-houses of Europe from February to April.

Cultural Note.—The cultural treatment of *Od. Rossii* is the same as that of *Od. Cervantesii* and *Od. Oërstedii.*

Od. Schlieperianum.

Pseudo-bulbs, leaves, and inflorescence as in *Od. grande.* Flowers somewhat smaller than those of *Od. grande*; sepals oblong-ligulate, yellow with oblong reddish brown bars; petals similar but broader, with three or four reddish brown bars on the basal half only; lip obovate, emarginate, pale sulphur-yellow with three or four dull brown transverse bars at the base; crest tuberculose, orange-yellow with a crimson border. Column stoutish with an auricle on each side of the stigmatic cavity.

Odontoglossum Schlieperianum, Rchb. in Gard. Chron. 1865, p. 1082. Id. *Xen. Orch. II.* p. 127, t. 143 (1867). Regel's *Gartenfl.* 1869, t. 605. *Fl. Mag.* t. 461.
Od. Insleayi macranthum, Lindl. Fol. Orch. Od. No. 8.

According to Professor Reichenbach, *Od. Schlieperianum* first appeared among a miscellaneous lot of Central American Orchids, offered for sale at Stevens' Rooms some time in 1856. It was subsequently collected by Herr Wendland, of the Royal Gardens, Herrenhausen, near Carthago in Costa Rica, to which country, so far as at present known, it appears to be confined. As a species it is intermediate between *Od. grande* and *Od. Insleayi;* it was referred by Lindley to the last-named as a variety, but by Reichenbach it was raised to specific rank, dedicating it to Herr Schlieper, of Elberfeld, in Germany, in whose collection it flowered soon after its introduction.

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* Il fallait choisir, tant est considérable le nombre des variétés toutes plus belles les unes que les autres, produites par cette gracieuse espéce. Ici, c'est une nuance plus fonçée, là un coloris différent, là encore des fleurs plus grandes ou des spécimens à floraison plus abondante. En verité, il n'y a rien d'étonnant que cet Odontoglossum soit si diversement décrit, ni qu'il ait été baptisé de tant de noms différents dans nos cultures. *La Belgique Horticole*, 1883, p. 233.

† The *Od. Humeanum* of some collections is not this, but a slight deviation from *aspersum*. The original plant appeared in the collection of the late Mr. Burnley Hume.

Od. tripudians.

Pseudo-bulbs and leaves nearly as in *Od. Pescatorei.* Scapes arching, longer than the leaves, racemose, 8—12 flowered. Flowers 2—2½ inches in diameter; sepals elliptic, acuminate, chestnut-brown with yellow tip and base, and sometimes with one or two intermediate yellow streaks; petals similar, yellow with broad transverse chestnut-brown blotches; lip with a short claw enlarged in front into a sub-orbicular apiculate lobe with a jagged edge, white, sometimes pale yellow with rose-coloured or crimson blotches; crest with numerous radiating bristle-like processes, of which the middle ones are larger and longer than the others. Column with two toothed wings.

Odontoglossum tripudians, Rchb. in Bonpl. II. (1854), p. 100. Id. in Gard. Chron. 1871, p. 938, and 1872, p. 393. *Bot. Mag.* t. 6029. *Fl. Mag.* n. s. t. 208.

Discovered by Warscewicz about the year 1849. It was in cultivation in M. Linden's establishment in 1857, and twelve years later it was imported from New Granada by Messrs. Low and Co. We subsequently received it from the neighbourhood of Ocaña; its habitat is a branch of the eastern Cordillera that runs parallel with the river Madelina, one of the numerous tributaries of the Magdalena; here it occurs for a distance of about 100 miles at 5,000—7,500 feet elevation, flowering all the year round.* It is also abundant on the numerous spurs and offsets on the western side of the main range from Ocaña to Bucaramanga at 6,000—9,000 feet elevation. It flowered for the first time in this country in the collection of Mr. John Day, at Tottenham, in December, 1870. *Od. tripudians* is variable as regards the colour of the perianth segments, especially the lip and its markings, the ground colour of which varies from canary-yellow (*xanthoglossum*) to white (*leucoglossum*), and the markings from crimson to pale rose. The specific name, from *tripudiare,* "to dance or caper," refers to the fanciful dancing attitude of the flowers.

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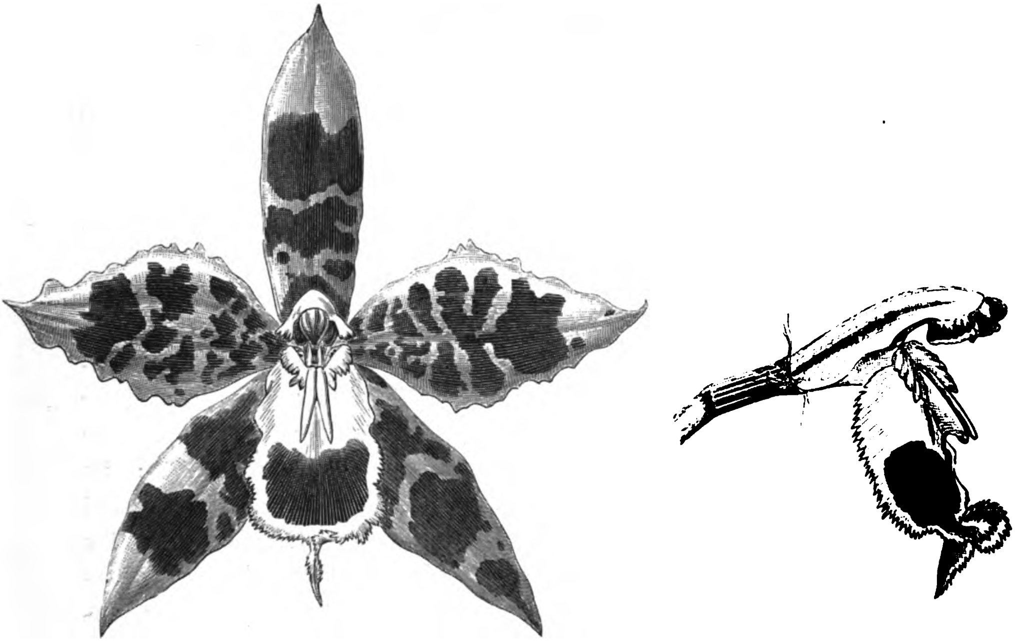
* Kalbreyer in lit.

One of the finest of the colour or sub-varieties has been named *Harryanum* by Professor Reichenbach (Gard. Chron. XIX. (1883), p. 210), in compliment to the head of our firm. This has the sepals and petals very deep brown, and the whole of the base of the lip is of the richest mauve-purple. This beautiful form is now in the collection of the Hon. Erastus Corning, at Albany, New York.

Od. triumphans.

Pseudo-bulbs ovoid, compressed, 3—4 inches long, diphyllous. Leaves ensiform, 12—15 inches long. Scape arching, 24—36 inches long, racemose, seldom paniculate. Flowers 3 inches across; sepals oblong, acute, narrowed at the base; petals broader, apiculate, the margin sinuate or notched; both sepals and petals golden yellow blotched with cinnamon-brown; lip clawed with an oblong acute denticulate blade, the basilar portion of which is white or pale yellow, and the anterior portion cinnamon-brown, bordered with white or pale yellow; crest, a broad white (rarely yellow) raised plate, terminating in two diverging teeth. Column with two indented truncate wings, white.



Odontoglossum triumphans.

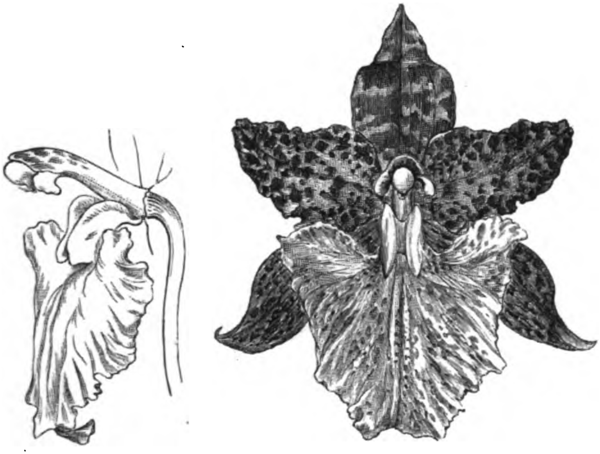
Odontoglossum triumphans, Rchb. in Bonpl. II. p. 99 (1854). Id. in Gard. Chron. 1867, p. 516. Linden's *Pesc.* t. 46, 1860. *Illus. hort.* 1869, t. 609. Batem. *Monogr. Od.* t. 23 (1874). *Fl. et. Pomol.* 1877, p. 217. De Puydt, *Les. Orch.* t. 30. Williams' *Orch. Alb. II.* t. 58. Od. spectatissimum, Lindl. Fol. Orch. Od. No. 55 (?).

Od. triumphans was one of the discoveries of M. Linden, who gathered it on the eastern Cordillera of New Granada, near Pamplona, in 1842—3. It was afterwards (1848—9) found by Warscewicz, who sent it to Europe under the name of *Od. Halli*, with which species it thence, for a time, became confused.* Its range is from Pamplona northwards as far as La Cruz, in the dense forests that cover the higher declivities of the eastern Cordillera, from 5,000—10,000 feet elevation, where it is sometimes found associated with *Od. Pescatorei*.†

It does not appear to have been known in British gardens till 1867—8, when it was in cultivation in Messrs. Low's Nursery at Clapton; its usual flowering season is from March to May.

Od. Uro-Skinneri.

Pseudo-bulbs ovoid, compressed, diphyllous. Leaves ovate-lanceolate, 8—10 inches long. Scape stoutish, erect, 24—36 inches long, racemose, sometimes panicled. Flowers 2—3 inches across vertically; sepals and petals chestnut-brown mottled and marked with green, the former oval, keeled, the latter broadly ovate, much broader than the sepals; lip clawed with two erect lamellæ on the claw; blade broadly cordate, crisped and waved, pale rose, mottled with white. Column winged.



Odontoglossum Uro-Skinneri.

Odontoglossum Uro-Skinneri, Lindl. in Gard. Chron. 1859, pp. 708, 724. Batem. *Monogr. Od.* t. 2 (1874). Warner's *Sel. Orch. III.* t. 17.

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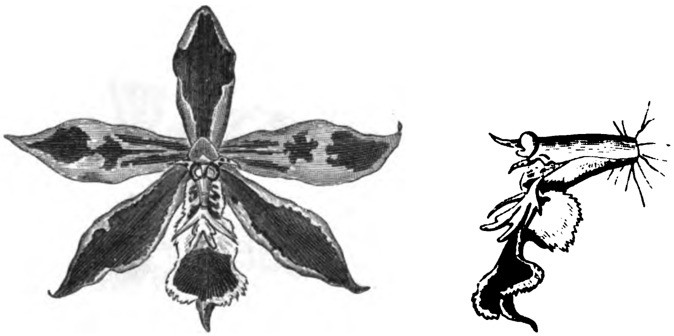
* Illus. Hort., 1871, sub. t. 58.

† Kalbreyer in lit. Kalbreyer also informs us that an Odontoglossum very much like *Od. triumphans*, if not the same, is occasionally found with *Od. crispum* on the Cordillera east of Bogota.

The latest discovery of Mr. G. Ure Skinner, who "found it on rocks at a considerable elevation near the village of Santa Catarina, 28 leagues from Guatemala." Mr. Skinner sent plants to our Chelsea nursery in 1854, but owing to the defective treatment of cool Orchids in vogue at that time, none of them could be induced to flower till 1859, although most of them were preserved alive. This Odontoglot is now well known as a nearly allied species to *Od. bictonense*, but of more robust growth, and with much larger flowers that usually appear in the months of July and August, when few other Odontoglots are in bloom.

Od. Wallisii.

Pseudo-bulbs ovoid, compressed, ancipitous, diphyllous. Leaves linear, 12—15 inches long. Scapes as long as the leaves, nodding, racemose, 9—12 flowered. Flowers 2 inches across, distantly placed along the rachis; sepals and petals similar and equal, oblong-lanceolate, acute, the former wavy, cinnamon-brown margined with yellow, the latter spread out like the arms of a cross, yellow blotched with brown; lip panduriform, the two lateral lobes fringed, white, the anterior lobe apiculate, wavy with a jagged margin, rose purple bordered with white; crest white, consisting of two diverging toothed plates with filiform lateral appendages near the basal end. Column with two deflexed cirrose wings.



Odontoglossum Wallisii.

Odontoglossum Wallisii, Rchb. in Gard. Chron. 1870, p. 104. *Illus. hort.* 1871, t. 56. Od. purum, Rchb. in Gard. Chron. 1872, p. 1323.

Discovered by Wallis in 1868 on the Sierra Nevada, near Merida, in Venezuela, and sent by him to M. Linden's horticultural establishment in Belgium, where it flowered in the spring of the following year. The plant is easily distinguished among Odontoglots by its grass-like foliage; the flowers are variable in colour, the lip being sometimes white with some rose-purple spots near the base.

In addition to the Odontoglots described in the foregoing pages, there are others in cultivation which cannot be conveniently classed with them, consisting of (1) natural species with small and less showy flowers, that occasionally find their way into European gardens among the importations of their more distinguished congeners; and (2) supposed natural hybrids, whose forms are so nearly intermediate between those of the presumed parents, that they cannot properly be referred as varieties to either. As our synopsis of the cultivated Odontoglots would be incomplete without some notice of these, we have included the best known in the following supplementary section, and of which the descriptions are necessarily less detailed than of the more important types; the reader desirous of fuller information should consult the literary references quoted.

There remains a third category more extensive still, but of which we can take no cognisance, viz., those small-flowered Odontoglots that are known to science only as herbarium specimens, and the many supposed natural hybrids that have been introduced from time to time, and have received distinguishing names, but which we have not seen nor do we find any record of their being still in cultivation.

Od. astranthum.

A native of the Ecuadorean Andes, where it was discovered by Wallis about the year 1868 while collecting plants for M. Linden's horticultural establishment at Ghent; it was subsequently gathered by Dr. Krause and by Klaboch. The inflorescence is paniculate like that of *Od. odoratum*, which its stellate flowers also resemble in size and colour, but differ essentially in their fringed antherium, bidentate calli, the form of the labellum, and in some other details. The sepals and petals are pale yellow streaked and blotched with red-brown; the lip is paler, sometimes white, with rose-coloured spots and orange-yellow crest.

Odontoglossum astranthum, Rchb. in Gard. Chron. 1867, p. 404. Id. XVII. (1882), p. 826.

Od. brachypterum.

One of a group of natural hybrids, of which *Od. Pescatorei* and *Od. luteo-purpureum* are the supposed progenitors. The sepals and petals are broadly ligulate, rather short, light yellow with a few cinnamon blotches; the blade of the lip is fiddle-shaped, emarginate, light yellow with a large cinnamon blotch in front of the crest, which consists of five parallel keels, the lateral medium ones being the longest, and produced in upright serrate lamellæ. It was introduced by us from the neighbourhood of Ocaña in New Granada. Very near this are *Od. Horsmanni* (Rchb.), and *Od. Kalbreyeri* (Rchb).

Odontoglossum brachypterum, Rchb. in Gard. Chron. XVIII. (1882), p. 552.

Od. crinitum.

Professor Reichenbach describes this as being "none of those mule-like things, but a most distinct Odontoglot, not even comparable to any one previously known." It was discovered some years ago by Roezl, in eastern New Granada, and afterwards by Wallis in the same locality. The earliest notice of it as an horticultural plant was in the summer of 1882, when it flowered in the collection of Mr. Broom at Woodlawn,near Manchester. The scape, sometimes paniculate, sometimes racemose, bears yellow and brown flowers that are 2½ inches across vertically; the sepals and petals are somewhat narrow and pointed; the blade of the lip is triangular with the edge minutely serrate, and the crest is composed of a number of thread-like processes, which suggested the specific name.

Odontoglossum crinitum, Rchb. Xen. Orch. II. p. 207 (1874). Id. in Gard. Chron. XVIII. (1882) p. 40.

Od. Dormanianum.

This is a very beautiful Odontoglot that appeared among one of Messrs. Sander's importations from New Granada in 1882. It has the habit of *Od. blandum*, but the lip and its calli clearly separate it from that species. The floral segments have all the narrowly lanceolate tapering form and shorter lip characteristic of the *Od. nævium* group, to which it belongs. The ground colour of the flower is pale yellow; this is densely spotted with mauve-purple. Its nearest affinity is *Od. crocidipterum*, to which it may probably be hereafter referred. It is dedicated to Mr. Charles Dorman, of Lawrie Park, Sydenham.

Odontoglossum Dormanianum, Rchb. in Gard. Chron. XXI. (1884), p. 11.

Od. elegans.

A supposed natural hybrid from the Andes of Ecuador, of which *Od. cirrosum* and *Od. cristatum** are the probable parents. The following description is that of a noble arching scape 30 inches long, taken from a plant in the collection of Mr. H. M. Pollett, at Fernside, Bickley: The flowers, which are somewhat distantly placed along the rachis, are fully 3 inches across; the sepals and petals are nearly those of *Od. cirrosum*, the former reddish brown with two or three pale yellow transverse bars and tips, the latter pale yellow with a large brown central blotch and some smaller ones towards the base, where there is also a bright purple-crimson one; the lip is narrow, reddish brown in front of the crest, the apical portion whitish; the crest consists of two parallel lamellæ, terminating in front in two upturned teeth, and numerous radiating bristle-like processes on each side; this organ is bright orange with a red streak on each bristle. The column is white.

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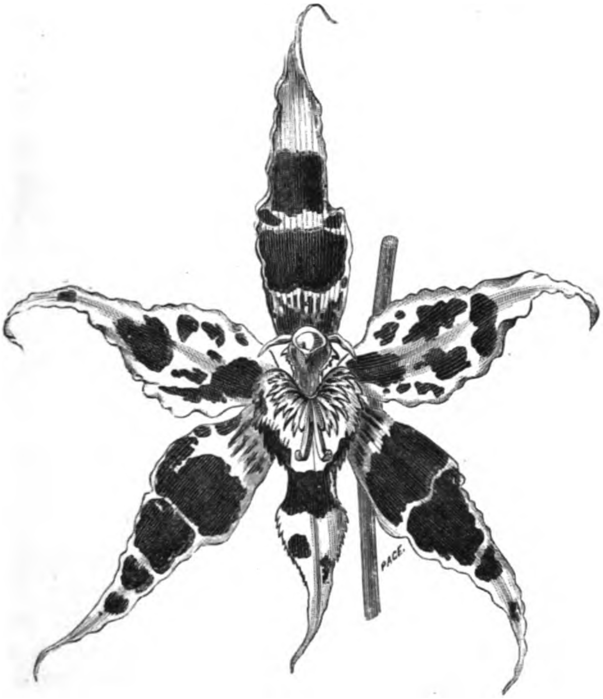
* Various characters in the plant and flowers have also suggested the hypothesis of *Od. Halli* being one parent in the place of *Od. cristatum*.

Odontoglossum elegans, Rchb. in Gard. Chron. XI. (1879), p. 462. Williams' *Orch. Alb. III.* t. 111. *The Garden, XXVI.* (1884), t. 459.



Odontoglossum elegans.

Od. eugenes.

A very striking Odontoglot that appeared among one of our own importations of *Od. Pescatorei*, and now in the collection of His Grace the Duke of Sutherland, at Trentham, in Staffordshire. It is a supposed hybrid between *Od. Pescatorei* and *Od. triumphans*, resembling the former in its vegetation and the latter in its inflorescence. The sepals are pale yellow blotched with chestnut-brown, the blotches being usually arranged in three groups; the petals have a broad margin of pale yellow with a white base and centre in which are a few chestnut-brown spots; the lip is that of *Od. triumphans*, while its crest is nearly that of *Od. Pescatorei*. The column is white and has two broad dentate wings.

Odontoglossum eugenes, Hort. Veitch, 1883, and supra.

Od. excellens.

A beautiful Odontoglot which first appeared in the collection of Sir Trevor Lawrence, Bart., at Burford Lodge, and recently in two or three other places. It is of supposed hybrid origin, the presumed parents being *Od. Pescatorei* and *Od. tripudians.** The flowers are as large as those of *Od. tripudians;* the sepals are bright yellow, paler in the centre with two clusters of chestnut-brown blotches, which sometimes coalesce; the petals are bright yellow with a single and smaller cluster of blotches in the centre, below which and reaching to the base is a broad white band; the lip is white with several large reddish spots on the blade and some smaller ones around the crest, which is orange-yellow.

Odontoglossum excellens, Rchb. in Gard. Chron. XVI. (1881), p. 426. *The Garden, XXI.* (1882), t. 330.

Od. Galeottianum.

A very rare Odontoglot from Mexico, resembling in its vegetation a robust *Od. Cervantesii.* The flowers are white with a few transverse reddish brown bars at the base of the petals and some yellow streaks on the crest of the lip. Although long known to science it was not introduced till 1870, when it appeared among an importation of *Od. Cervantesii,* by Messrs. Low and Co., and a few years later among an importation of Mexican Orchids by Mr. B. S. Williams, of Holloway. Professor Reichenbach suggests the possibility of its being a hybrid between *Od. Cervantesii* and *Od nebulosum.*

Odontoglossum Galleottianum, A. Rich. in An. Sc. Jan. 1845. Lindl. Fol. Orch. Od. No. 22 (1852). Rchb. in Gard. Chron. 1870, p. 39.

Od. gracile.

An Ecuadorian species discovered by Hartweg, on the Cordillera near Loxa. The plant is easily recognised by the peculiar blackish tinge of its pseudo-bulbs, leaves, and scape, the latter being paniculate with short branches, each bearing 2—3 flowers. The flowers are about an inch in diameter, reddish brown; the lip is fleshy with two whitish lamellæ on the disc. This singular Odontoglot is in cultivation in Sir Trevor Lawrence's collection at Burford Lodge.

Odontoglossum gracile, Lindl. Fol. Orch. No. 42 (1852).

Od. Horsmanii.†

A supposed natural hybrid between *Od. Pescatorei* and *Od. luteo-purpureum* collected by Mr. F. Horsman, near Ocaña, for the New Plant and Bulb Company, at Colchester, about the year 1879. The inflorescence is racemose, the flowers as large as those of *Od. Pescatorei,* pale sulphur-yellow spotted with cinnamon-brown; the lip is broad, obscurely pandurate with an orange-yellow crest.

Odontoglossum Horsmanii, Rchb. in Gard. Chron. XIII. (1880), p. 41.

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* Or *Od. triumphans.* † Not seen by us.

Od. ioplocon.[*]

An Odontoglot that appeared at one of the Orchid sales, at Stevens' Rooms, in the spring of 1884. It is very near *Od. Edwardi*, with which it entirely agrees in colour, but differs in its longer, narrower, and more undulate sepals and petals, in its much smaller lip, and in the forms of the calli and column wings—differences that seem to indicate a hybrid origin.

Odontoglossum ioplocon, Rchb. in Gard. Chron. XXI. (1884), p. 445.

Od. marginellum.

A curious species of little horticultural interest, recently introduced; its native country is not recorded. The scape is 18—24 inches long, branched, many-flowered. Flowers 1½—2 inches in diameter, with narrow (almost linear) wavy pale yellow-green sepals and petals barred with chestnut-brown, and oblong, apiculate, reddish brown lip margined with yellow. The column is slender and wingless.

Odontoglossum marginellum, Rchb. in Gard. Chron. XVIII. (1882), p. 680.

Od. Marriottianum.[†]

A distinct Odontoglot imported by Mr. Marriott, of Edmonton, among a lot of *Od. cirrosum*, to which species it may hereafter be referred. It has elongated pseudo-bulbs somewhat like those of *Od. Halli*; the leaves also approach those of that species. The flowers are large with narrow segments reflexed at the tips as in *Od. cirrosum*, white spotted with pale purple; crest of lip yellow streaked with pale purple.

Odontoglossum Marriottianum, Rchb. in Gard. Chron. XV. (1881), p. 168.

Od. Murrellianum.

A supposed hybrid between *Od. nævium* and *Od. Pescatorei* that appeared in 1875 among a number of the last-named in the collection of the late Mr. Burnley Hume, at Winterton, in Norfolk. The sepals and petals are pale purplish violet irregularly blotched with a deeper shade of the same colour; the lip is distinctly three-lobed, and has the lamelliform toothed crest of *Od. Pescatorei*. A few years later another form appeared in the collection of the late Mr. J. S. Bockett, at Stamford Hill, and again in a continental garden, differing from the Winterton plant in the pale purplish violet of the sepals and petals taking the form of a marginal band, whence the variety was called *cinctum*. The original plant, named after Mr. Murrell, gardener to Mr. Hume, is still under his charge. The variety *cinctum* is figured in the *Gartenflora*.

Odontoglossum Murrellianum, Rchb. in Gard. Chron. III. (1875), p. 653. Regel's *Gartenfl.* t. 1101.

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[*] Ιοπλόκον lit., violet woven, *i.e.*, a wreath of violets.

[†] Not seen by us.

Od. rigidum.

One of Hartweg's discoveries in 1842 on the Peruvian Andes near Loxa; it was also gathered by Matthews on Chachapojas, but it remained known only through their herbarium specimens till quite recently; it is now in cultivation in several collections. It has ovate pseudo-bulbs, linear leaves, and a tall paniculate inflorescence. Flowers on long foot-stalks, bright canary-yellow; sepals and petals oblong, acute; lip deeper in colour than the other segments, with a long claw and sub-quadrate blade that has an apiculus in the centre of the anterior margin; crest bidentate. Column three-angled, green at the base, yellow at the apex.

Odontoglossum rigidum, Lindl. Bot. Reg. 1845, misc. p. 58. Id. Fol. Orch. Od. No. 17 (1852). Rchb. in Gard. Chron. XXVI. (1886), p. 70.

Od. Schillerianum.

A species discovered by Wagener in 1852—3, on the Sierra Nevada, near Merida in Venezuela, but not introduced till 1883, when it was imported by Messrs. Sander and Co., of St. Albans. The following description is that of a plant which flowered at Burford Lodge, in the spring of 1885. Pseudo-bulbs ovoid, compressed, 2½ inches long, diphyllous. Leaves ensiform, acute, 9—12 inches long. Scape as long as the leaves, 5-flowered. Flowers 2 inches in diameter; sepals and petals ovate-oblong, yellow blotched and spotted with chestnut-brown; lip broadly triangular, with two erect auricles at the base where it is pale yellow, and also at the tip; central area reddish brown and downy; calli two, white. Column with two cirri at the apex.

Odontoglossum Schillerianum, Rchb. in Bonpl. II. p. 12 (1854). Id. *Xen. Orch. I.* p. 58, t. 22. Id. in Gard. Chron. XXI. (1884), p. 577.

Od. Schroederianum.*

"A unique Odontoglot, quite unlike anything that has appeared before in Europe." So writes Professor Reichenbach. "The sepals and petals are oblong, acute, wavy, white with mauve-purple blotches; the lip is pandurate, white with two mauve-purple blotches on the fore part of the disc, and the calli are yellow with some red spots. A much developed callus in front of the column shows on each side a plate of radiating spines, as in both *Od. tripudians* and *Od. Pescatorei.* It may be a cross between these." It appeared in the collection of Baron Schroeder, at the Dell, near Staines, to whom it is appropriately dedicated.

Odontoglossum Schroederianum, Rchb. in Gard. Chron. XVII. (1882), p. 700.

Od. stellatum.

An unattractive species widely distributed over Central America, from Mexico to Panama. It was originally discovered by Hartweg in

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* Not seen by us.

Mexico, and was subsequently gathered by Skinner in Guatemala, and by Warscewicz in Veragua. It is a dwarf plant with small monophyllous pseudo-bulbs; the flower scapes are erect, a little longer than the leaves, one (rarely two) flowered, the flowers being about 1½ inches across. The sepals and petals are dull olive-green with some transverse brown streaks; the lip white with sometimes a rose-coloured blotch at the base. Its nearest affinity is *Od. Rossii*, with which it is sometimes imported.

Odontoglossum stellatum, Lindl. in Bot. Reg. 1841, misc. 25. Id. Fol. Orch. Od. No. 18, (1852). Batem. *Monogr.* t. 18. Od. erosum, Reich. in Bonpl. II. p. 99, fide Bateman.

Od. stellimicans.*

A bright-coloured Odontoglot that appeared among one of Messrs. Sander and Co.'s importations of *Od. Pescatorei*, and supposed to be a natural hybrid between that species and *Od. triumphans* or *Od. tripudians*. The sepals and petals are stellate, clear yellow, the former with a few large reddish brown blotches, and the latter with a single brown line near the base; the lip is pandurate, yellow spotted with reddish brown at the base.

Odontoglossum stellimicans, Rchb. in Gard. Chron. XXII. (1884), p. 680.

Od. tentaculatum.

A bright-coloured Odontoglot recently introduced by Messrs. Sander and Co., apparently near *Od. Lindleyanum*. The sepals are chestnut-brown bordered with bright yellow, and with some yellow markings on the central area; the petals are yellow spotted with chestnut-brown; the lip has a long square chestnut blotch in front of the calli, the apical portion being bright yellow; the calli are white, and have several long teeth on each side, and the column wings are furnished with two long and several short bristle-like processes. The last-named characters indicate a hybrid origin, and point to *Od. Lindleyanum* and *Od. crispum* as the probable parents.

Odontoglossum tentaculatum, Rchb. in Gard. Chron. XIX. (1883), p. 814.

Od. velleum.

This was first brought under notice in 1874, through Messrs. Low and Co., to whom it was sent from Ecuador by one of their collectors, but the materials for description were imperfect. It has since been imported by Messrs. Sander and Co., one of whose plants, acquired by Mr. H. J. Buchan, of Wilton House, Southampton, and exhibited by him at one of the Royal Horticultural Society's meetings in 1885, showed the following characteristics:—Pseudo-bulbs ovoid, compressed, 2 inches long, diphyllous. Leaves linear-oblong, 8—10 inches long. Scape longer than the leaves, bearing a raceme of 10 flowers, each about 2 inches in diameter. Sepals

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* Not seen by us.

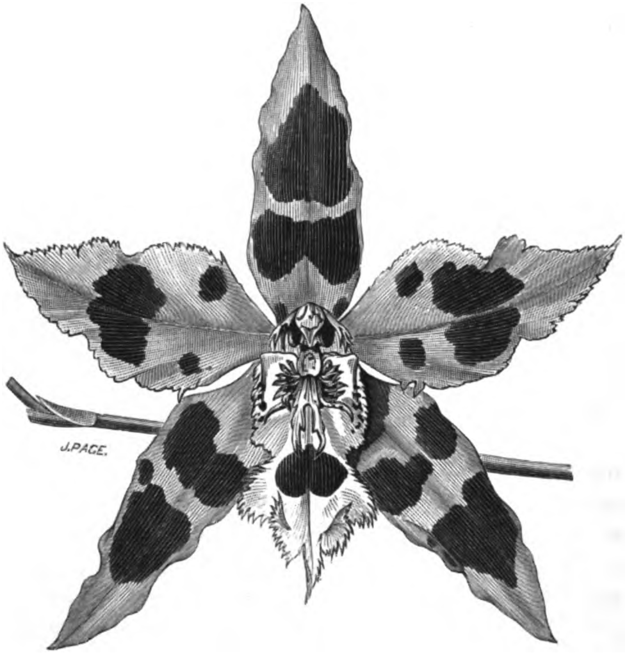
and petals similar, stellate elliptic-oblong, acute, yellow with 4—5 brown blotches on each; lip lanceolate, acute, much smaller than the other segments, brown with yellow tip and base; calli consisting of two series of radiating bristles, of which the anterior two are longest.

Odontoglossum velleum, Rchb. in Gard. Chron. I. (1874), p. 406.

Od. vexativum.

A supposed natural hybrid between *Od. maculatum* and *Od. nebulosum* that appeared in Lord Londesborough's collection at Norbiton in 1876. The plant is intermediate in habit between the two supposed parents; the flowers are as large as those of *Od. nebulosum*, with broad sepals and petals, the former brown bordered with white, the latter white with some brown spots near the base; the broad semi-ovate blade of the lip is also white with a few olive-brown spots at the base; the crest, which is nearly that of *Od. maculatum*, is yellow spotted with red; the wingless column is white.

Odontoglossum vexativum, Rchb. in Gard. Chron. VI. (1876), p. 808.



Odontoglossum Wilckeanum.

Od. Wilckeanum.

A supposed hybrid between *Od. crispum* and *Od. luteo-purpureum*, first introduced by Messrs. Low and Co. in 1878 among an importation of the first-named. The flowers are 3—3½ inches across, the sepals are wavy at the margin, pale sulphur-yellow with two or three reddish brown irregular transverse bars and blotches; the petals much broader with a toothed edge, sulphur-yellow, with a few reddish brown spots chiefly on the basal and broad portion; the lip is that of *Od. crispum*, pale sulphur-yellow with a large reddish-brown blotch in front of the crest, which consists of two lateral thickened plates with radiating bristle-like processes along the margin, and two diverging teeth in front; the column has two small lacerated wings. *Od. Wilckeanum* flowered for the first time in Europe in the collection of M. Massange de Louvrex, at Baillonville, near Marche, in Belgium, under the care of M. Wilcke, his gardener, after whom it is named. It has since occurred frequently among importations of the two supposed parents, showing considerable variability in the colour and, in a less degree, in the size and form of the flowers; it is, however, unquestionably one of the most distinct of the supposed natural hybrids.*

Odontoglossum Wilckeanum, Rchb. in Gard. Chron. XIII. (1880), p. 298. Williams' *Orch. Alb. V.* t. 201 (pallens).

Excluded Species.

Odontoglossum Phalænopsis (Rchb.) ...	now referred to	... Miltonia Phalænopsis
Roezlii (Rchb.)... ...	„ „	... M. Roezlii
roseum (Lindl.)... ...	„ „	... Cochlioda rosea
vexillarium (Rchb.) ...	„ „	... Miltonia vexillaria
Weltonii (hort.) ...	„ „	... M. Warscewiczii
Warscewiczii (Rchb.) ...	„ „	... M. Endresii.

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* A remarkable variety of *Od. Wilckeanum* was recently offered at one of the London Orchid sales. The greater part of the area of all the segments, especially the sepals, was chestnut-brown, the remainder being French white, the white being confined chiefly to the basal half of the petals and the tips of these and the other segments.

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Vol II

C

A MANUAL

OF

ORCHIDACEOUS PLANTS

CULTIVATED UNDER GLASS IN GREAT BRITAIN.

PART VIII.

ONCIDIUM AND MILTONIA,

ADA, BRASSIA, GOMEZA, IONOPSIS, ORNITHOCEPHALUS.

JAMES VEITCH & SONS,
Royal Exotic Nursery, 544, King's Road, Chelsea, S.W.
1892.

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PRELIMINARY NOTICE.

THIS Manual is being compiled to supply amateurs and cultivators of exotic Orchids with a fuller account of the principal genera, species and varieties cultivated under glass, than is contained in the Manuals hitherto in use.

The rapid extension of Orchid culture during the last quarter of a century, resulting from the increased taste for and appreciation of this beautiful and interesting order of plants, has, in our opinion, created the *desideratum* which we are now attempting to supply. The prominent place, too, occupied by Orchids in the columns of the Horticultural Press, and the surprising amount of practical and varied information respecting them disseminated through its agency, has also stimulated the desire to obtain all the leading facts in a condensed form, to which easy reference may at any time be made.

So numerous are the species and varieties of Orchids at present in cultivation, and to which additions are constantly being made by new discoveries and by artificial hybridisation, that the labour attending the compilation of a Manual sufficiently comprehensive to meet the wants of cultivators must necessarily demand much time. Moreover, the present unsatisfactory state of Orchidology, especially in its horticultural aspect and its complicated and unscientific nomenclature, have rendered the compilation of such a Manual within a stated time almost an impossibility.

Under these circumstances, and yielding to the solicitations of patrons and friends, we have decided upon issuing the work in parts, each part containing a monograph of the cultivated species and varieties of one of the most important genera, or of a group of genera.

Little explanation of the plan of the work is here needed; the parts as issued must speak for themselves. We have only to state that in the scientific classification and sequence of the genera we have followed, with but trifling deviations, the arrangement of Bentham and Hooker as elaborated in their *Genera Plantarum*, the most profound and, at the same time, the most intelligible exposition of the Orchideæ extant. In the nomenclature of the species, we have adhered to the Laws of Botanical nomenclature adopted by the International Botanical Congress, held at Paris in August, 1867.

In the description of the species, we have been compelled to use occasionally a few technical terms to avoid cumbrous circumlocutions; at the conclusion of the work we propose giving a glossary of the terms so used. In the cultural notes we have quoted temperatures in the Centigrade scale with the equivalent Fahrenheit readings, in the hope that the far more rational scale, now almost universally adopted in scientific investigations, may also come into use in horticulture. The literary references in italics indicate coloured plates of the species or variety described.

ONCIDIUM.

Swartz in K. Vet. Acad. Stockh. Nya, Handl. XXI. p. 239 (1800). Lindl. Gen. et Sp. Orch. p. 196 (1832). Benth. et Hook. Gen. Plant. III. p. 562 (1883).

The genus Oncidium was formed out of the heterogeneous group of species brought by Linnæus under Epidendrum by his successor Oloff Swartz. Swartz knew but five species when he founded the genus, but so rapid has been the progress of discovery since, that upwards of three hundred have now been published, including doubtless several horticultural varieties; and of these, nearly three-fifths are said to have been in cultivation at one time or other. Besides the species known to science, numbers of others are known to exist in the vast forests and along the river valleys of the great South American continent,* where many have been seen by explorers, and especially by orchid collectors who have voluntarily passed them over. The genus Oncidium is thence one of the most extensive in the Orchidean family, and spreads over an area as great as that occupied by Epidendrum, with which, in fact, it nearly coincides geographically. In its botanical aspect Oncidium is, as Mr. Bentham aptly put it, "a natural genus now well known and rarely confounded with its allies."† But, as already stated under Odontoglossum, it unites with that genus in one direction, and it also merges into Miltonia in another, and hence it has occasionally happened that the same species has been referred to Odontoglossum, to Oncidium, or to Miltonia by different authors.

In a horticultural sense, although Oncidium includes a large number of species with handsome flowers of striking and even peculiar colours that render them of exceptional interest as decorative plants, there are many of them that are not regarded by the cultivators of orchids as an unmixed gain, for whether the circumstances attending the environment of the plants in their native forests are too imperfectly known, or the climatic conditions under which they live cannot be approached sufficiently near by artificial means, or from some physiological cause inherent in the plants themselves, certain it is that of the thousands of Oncids that have been imported from Central and

---

* *See* Wallace's *Travels on the Amazon and Rio Negro*, p. 178.

† Journ. of Linn. Soc. XVIII, p. 238.

South America a very small proportion of them have remained denizens among us for any length of time.

The following diagnosis from the *Genera Plantarum* defines the extent of the genus:—

> The *sepals* are generally sub-equal, spreading or reflexed; they are either all free or the lateral two are connate at their base; in some species the lateral sepals are much longer and narrower than the dorsal one.
>
> The *petals* are either similar to the dorsal sepal or larger.
>
> The *lip* is affixed to the base of the column by a short claw that is divergent or spreading;* the side lobes are adnate to the claw and usually small or obsolete, the intermediate lobe is spreading, very broad, emarginate or bifid (in the section MICROCHILA entire, narrow and reflexed); the disk at the apex of the claw is conspicuously crested or tuberculate.
>
> The *column* is short and thick, with a petaloid wing on each side of the stigma, below which there is a prominent protuberance.
>
> The *pollinia* are two, globose or inversely egg-shaped, united to the gland by linear or flattened caudicles (stipes).
>
> The *capsule* is usually ovoid-oblong, sometimes fusiform, more or less rostrate.

Generally.—The essential characters of Oncidium are the short thick winged column that is nearly always tumid below the stigma, and the tuberculated or much-toothed crest of the labellum;† the first-named character chiefly separates it from Odontoglossum and the latter from Miltonia. Besides these there are characters in the habit and inflorescence by which cultivators recognise many species of Oncidium.

The vegetative organs of Oncidium are essentially the same as those of Odontoglossum, and are fully described under that genus; it is here only necessary to notice some of the most obvious deviations that occur in the cultivated species.

> In *Oncidium zebrinum*, and in a less degree in *On. flexuosum*, the rhizome is much developed and becomes scandent. In *On. Papilio*, *On. Kramerianum*, *On. ampliatum*, and one or two others, the pseudo-bulbs are disk-like with the sides more or less corrugated. *On. bicallosum*, *On. carthaginense*, *On. Cavendishianum*, *On. Lanceanum*, *On. luridum* and two or three other allied species are without pseudo-bulbs, but

---

* In Odontoglossum the claw of the lip is always parallel with the face of the column.

† This is an important character in the determination of species, but often so complicate in structure as to render it extremely difficult to describe. In cases of doubt the reader should always refer to a good drawing of the species when one is accessible.

have leaves that are much larger and thicker in texture than the pseudo-bulbous species. *On. Cebolleta*, *On. Jonesianum*, and three or four other species not known to be at present in cultivation, have terete, fleshy leaves, channelled on one side. Another deviation from the usual ensiform leaves of Oncidium is seen in *On. pulchellum*, *On. tetrapetalum*, *On. urophyllum*, and three or four others that are now but rarely if ever seen in cultivation; all these have rigid, triquetral, equitant leaves. The inflorescence of many Oncids is remarkable for the extraordinary length attained by the peduncle, which sometimes rambles in a flexuose, irregular manner for several yards, branched at irregular intervals, and bearing flowers that may be sometimes counted by the hundred. No species of Odontoglossum is yet known with a peduncle longer than 3—4 feet.

The genus Oncidium, as above stated, was founded by Swartz, the Swedish botanist, at the beginning of the present century on the West Indian species *altissimum, carthaginense, Cebolleta, tetrapetalum* and *variegatum,* which he separated from the Linnæan genus Epidendrum. The name is derived from the Greek word ὄγκος (onkos), "a tumour or swelling," in reference to the warty excrescences always present on the labellum.*

Lindley distributed the species known to him, two hundred in all, into fourteen series or sections,† by far the greater number of which are founded upon characters so artificial that it is not surprising that a better acquaintance with many of the species and the subsequent introduction of new ones should tend to break down the sectional framework which Lindley so laboriously put together. Accordingly when Mr. Bentham revised the genus for the *Genera Plantarum* he reduced the sections to four, retaining only one founded on floral characters, viz., MICROCHILA, and restricting it to those species in which the front lobe of the labellum is small, narrow, and entire, as in *Oncidium macranthum*, *On. superbiens*, *On. serratum*, *On. zebrinum*, and other well-known and admired kinds.‡ The characters of the other three sections are derived from the leaves; these are EQUITANTIA, including those species with distichous, equitant leaves, as *On. pulchellum*, *On. tetrapetalum*, *On. urophyllum*, etc.; TERETIFOLIA, including *On. Cebolleta*, the type, *On. Jonesianum*, and three or four others with long fleshy terete leaves; and PLANIFOLIA, to which is referred all the species with flat leaves, except those included in MICROCHILA, thus lumping together a large majority of the species, some of which differ as much from each other in habit and inflorescence as they do from the species included in the other sections. Nevertheless, having regard to the extremely artificial nature of Lindley's sectional arrangement of the species of Oncidium—of many of which he himself complained "that the badness of materials, the imperfections of drawings and descriptions, and the misinformation so common in gardens concerning countries, have rendered errors unavoidable,"[*] a complaint that unfortunately holds true to a great extent at the present day,—and then to our ignorance of species that are believed to lurk in the depths of the South American forests, and of which not a scrap of information is yet available for scientific use, it is evident that a complete systematic arrangement of the species of Oncidium at the present time is simply impracticable. We may, however, remark with respect to Bentham's enormous section PLANIFOLIA, that such groups as that represented by *On. luridum* and its allies,[†] which are included in it, are almost as distinctly sectional as the *On. Cebolleta* group; and that the long, linear, erect dorsal sepal and petals of *On. Papilio* and its allies also afford a distinctive character which, although it did not escape Mr. Bentham's notice,[‡] was adopted by Dr. Lindley for his section GLANDULIGERA.

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* Swartz derived Oncidium from ’ογκίδιον, a word that does not occur in classical literature, but is rightly formed as a diminutive of ὄγκος.

† *Folia Orchidacea*, published in 1855. ‡ The genus Cyrtochilum of Humboldt and Kunth.

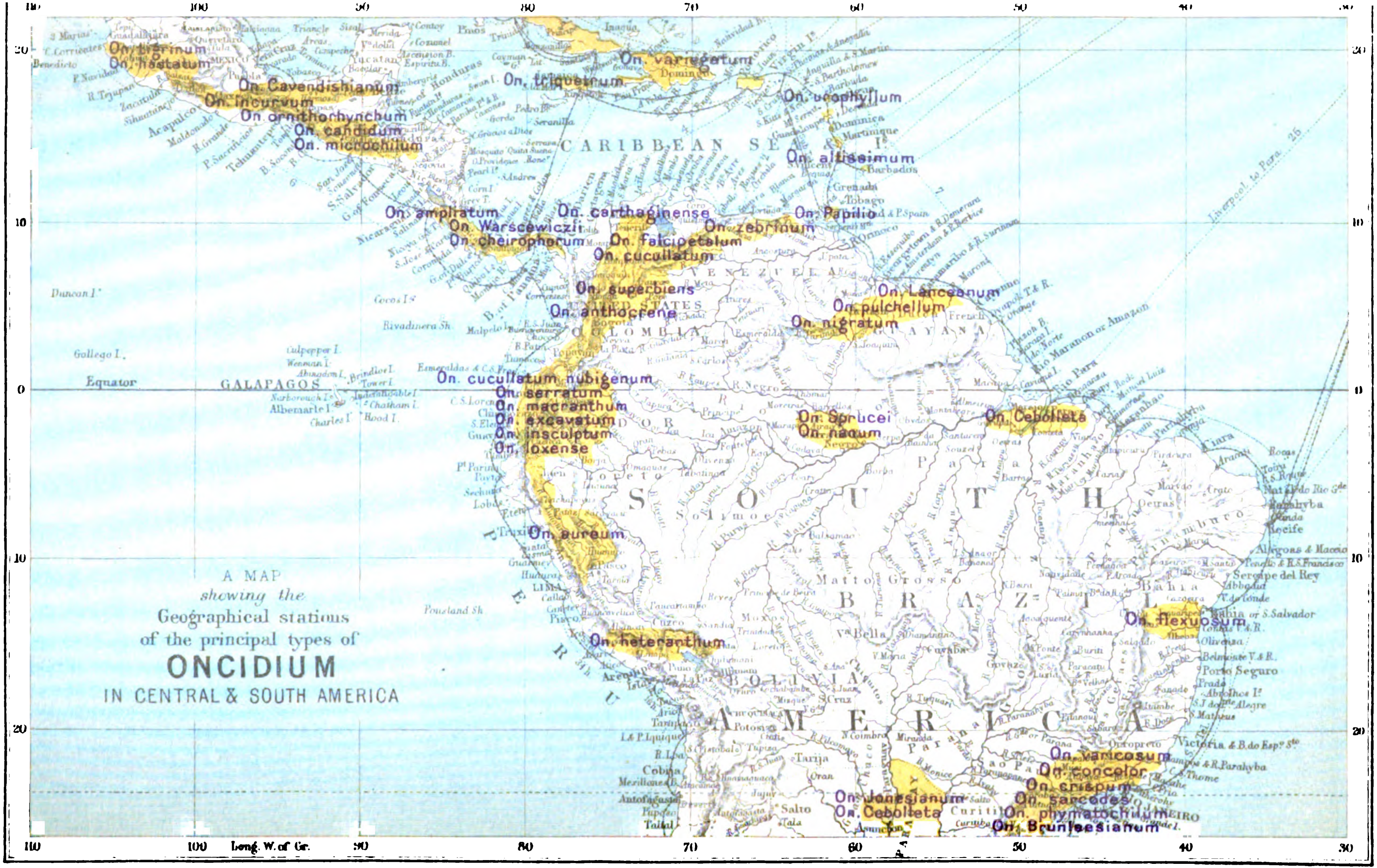
Geographical Distribution.—Owing to the vagueness of the information that has been communicated respecting the habitats of most of the species in cultivation and the total absence of it in the case of others and of some known only as herbarium specimens, the geographical distribution of Oncidium can only be stated in general terms. Thus, we know that Oncids have been gathered on the South American continent from Montevideo to the Isthmus of Panama, an expression that includes the whole of it as far as the 35th parallel of south latitude, but from which must evidently be excluded the Pampas of the Argentine Republic, the Campos of Brazil, the Savannahs of Venezuela, the arid tract along the Pacific coast, and other places of indefinable extent in which the climatic conditions are unsuited to orchid life. North of the Isthmus the Oncids are spread over Central America, Guatemala, and southern Mexico, becoming fewer in number in proceeding northwards till they disappear about the 20th parallel of north latitude. They are also generally dispersed over the West Indian Islands. Over this enormous area are spread an unknown number of species, most of them

---

[*] *Folia Orchidacea*, Oncidium, Introductory note.

[†] The sub-section *Sarcoptera* of Lindley, *Miltoniastrum* of Reichenbach.

[‡] *Oncidium Papilio* Lindl. et *On. Kramerianum* Rchb. insignes sunt sepalo postico petalisque erectis longe linearibus.—Gen. Plant. III. p. 563.



A MAP
showing the
Geographical stations
of the principal types of
ONCIDIUM
IN CENTRAL & SOUTH AMERICA

Stanford's Geog^l. Estab^t. London.

doubtless extremely local, some more widely distributed, while there are not wanting instances, as *Oncidium Cebolleta,* that have been reported from places thousands of miles from each other.* So far as at present known, the species are also very unequally scattered over this region. On the Organ Mountains and in the parts of the provinces of Rio de Janeiro, Minas Geraes and San Paulo immediately contiguous to them, a large number of species are aggregated; another aggregation of species occurs on the Andes of Ecuador, and thence northwards along the Cordilleras Oncids are comparatively numerous; but in other parts of South America and north of the Isthmus they appear to be much dispersed and even isolated in places. The diversity of station they affect is also very great: some occur only in the hottest and dampest river valleys or in proximity to the coast, of such is the group of which *On. carthaginense* and *On. Lanceanum* are well-known types; while in strong contrast to these the beautiful Ecuadorean varieties of *On. cucullatum* ascend to near the snow-line on the Andes near Quito. The Oncids included in the section MICROCHILA as limited by Bentham are also alpine; they are all found on the Cordilleras of Peru and Colombia, rarely ascending above 9,000 feet or descending below 5,000 feet. The species with equitant leaves are confined to the West Indian Islands and the maritime region of South America in their immediate neighbourhood. The most northern species known to us are *On. tigrinum* and *On. hastatum,* the most southern *On. bifolium* and *On. viperinum;* the most southern Andean species is probably *On. heteranthum* or *On. Weddelli.*

Cultural Notes.—In our introductory notes above we have intimated that Oncidiums generally are not regarded horticulturally as an unmixed gain in consequence of the comparatively small number of them that have, as yet, proved to be sufficiently tractable under cultivation for several years in succession. Of those species that rank among the most long-lived, the following are well known:—*ampliatum, cheirophorum, divaricatum, flexuosum, hastatum, incurvum, leucochilum, longipes, macranthum, ornithorhynchum, phymatochilum, pulvinatum, serratum, sphacelatum, tigrinum, trulliferum, Wentworthianum;* to these should be added the less frequently seen *auriferum, Batemanianum, excavatum,*

---

* We have seen herbarium specimens of the little *Oncidium iridifolium* from Panama, British Guiana, Trinidad, Bahia and Para in Brazil, the Andes of Quito, and Ibagué in New Granada—indeed, this plant appears to be ubiquitous in tropical America from Bananal in Brazil northwards.

insculptum, *Schlimii*, *volvox*.* Experience has long since amply demonstrated that *ampliatum* requires the highest temperature available in orchid culture, while *cheirophorum*, *incurvum*, *insculptum*, *leucochilum*, *macranthum*, *ornithorhynchum*, *serratum* and *tigrinum* thrive under the same treatment as the cool Odontoglots; *auriferum*, *Batemanianum*, *divaricatum*, *flexuosum*, *excavatum*, *hastatum*, *longipes*, *phymatochilum*, *pulvinatum*, *sphacelatum*, *trulliferum*, and *Wentworthianum* should be grown in an intermediate temperature with abundance of moisture during their growing season; all of which is conformable to what is known of these plants in their native home. With respect to the cultural treatment of the other Oncids described in the following synopsis, it is unfortunately necessary to speak with much reserve. Unquestionably the climatic conditions under which they grow in their native countries and the circumstances of their environment *in situ* when they can be ascertained, afford excellent indications of the treatment they should receive when transferred to the glass-houses of Europe, but such information has been forthcoming to only a very limited extent. As stated under the geographical distribution of the genus, the sub-section *Sarcoptera*, distinguished by large fleshy leaves and the absence of pseudo-bulbs, including *bicallosum*, *carthaginense*, *Cavendishianum*, *hæmatochilum*, *Lanceanum*, and *luridum*, are always found in the hottest and dampest places and generally in shade; these circumstances suggest a cultural treatment accordingly. On the other hand, the varieties of *cucullatum* that occur on the Andes of Ecuador, not far from the line of perpetual snow, live under conditions that cannot be approximately imitated artificially, but yet we have in our houses Masdevallias thriving satisfactorily that are found nearly under the same conditions which also should be suggestive.† *Cebolleta*, at least at its southern limit, and *Jonesianum* occur where there is a decided alternation of wet and dry seasons, the latter being from three to four months and even of longer duration, during which the plants are scorched by the direct rays of tropical sun. As to the Brazilian species from the neighbourhood of Rio, which live under nearly the same conditions as the Cattleyas and Lælias from the same region and which have proved to be so easy of cultivation, it is certainly paradoxical that these Oncids should refuse to thrive; two circumstances should at least be noticed—their inflorescence, at least in the greater number of them, is out of all proportion to the size of the plants, and their flower scapes are produced within a short time after importation and often before the plants can become established in their new home; it has thence been urged that cultivators should forego the flowering till the plants have acquired sufficient strength to produce their inflorescence without prejudicial results. The experiment is certainly worth the trial.

---

* This enumeration is not assumed to be a complete one of the Oncids that can be satisfactorily cultivated in the glass-houses of Great Britain. The experience of other growers may enable them to add others that are here omitted.

† *See* Masdevallia, p. 20.

Synopsis of Species and Varieties.

Oncidium altissimum.

Pseudo-bulbs ovate-oblong, compressed, with very acute edges, 3—3½ inches long and 2—2½ inches wide, mono-diphyllous. Leaves ligulate, acute, 10—12 or more inches long. Peduncles several feet long, shortly branched from below the middle upwards, each branch bearing 3—5 flowers; bracts membraneous, whitish, very acute, ½ inch long. Flowers 1½ inches in diameter; sepals and petals similar and sub-equal, narrowly oblong, undulated, pale yellow, barred and blotched with pale chestnut-brown along the central area; the lateral sepals free and divergent; lip three-lobed, the side lobes small, turned backwards, oblong, rounded at the free end, bright yellow; the front lobe with a broad saddle-like red-brown claw and transversely oblong emarginate blade, yellow above, white beneath; crest ten-toothed, the teeth arranged in two series of five each, of which the central one of the front five is the largest. Column wings narrow and rounded.

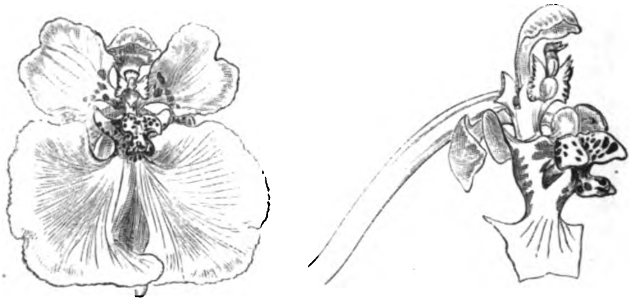
Oncidium altissimum, Swartz in K. Vet. Acad. Stockh. Nya. Handl. XXI. p. 240 (1800). *Bot. Mag.* t. 2990 (1830). Lindl. Gen. et Sp. Orch. p. 200. Id. *Bot. Reg.* t. 1851 (1836). Id. Fol. Orch. Oncid. No. 150. Epidendrum altissimum, Jacquin. Amer. p. 229, t. 141.

One of the first Oncids that became known to science and to horticulture. It was introduced to the Royal Gardens at Kew in 1793 by Rear-Admiral Bligh, but was shortly afterwards lost. It was sent to the Botanic Garden at Glasgow from the island of St. Vincent about the year 1829, and a few years later it was imported by Messrs. Loddiges, of Hackney. It is still occasionally seen in orchid collections, but it has declined in favour since the appearance of its more brilliantly-coloured congeners. *Oncidium altissimum* is generally dispersed over the West Indian Islands, British Guiana, and adjacent parts of South America, often growing in immense masses in the forks of the largest branches of the forest trees.

On. ampliatum.

Pseudo-bulbs broadly ovate or sub-orbicular, much compressed, almost discoid, 2½—4 inches in diameter, the flattened sides much wrinkled and mottled with dull purple, red and grey-green, changing to blackish brown when old, diphyllous. Leaves oblong or oblanceolate-oblong, 8—12 inches long and 1½—3 inches broad, complicate at the base, very leathery, dark green. Peduncles stoutish, sub-erect or arching, variable in length, the longest sometimes attaining 3—4 feet, branched towards the extremity. Flowers numerous, 1—1½ inches in diameter; sepals almost concealed by the petals and lip, the lateral two free, spathulate-oblong, concave at the dilated part, pale yellow, with 1—2 red-brown blotches; petals clawed, sub-orbicular, bright canary-yellow, white behind; lip large and spreading, with a short claw, two small oblong basal auricles with reflexed margin and a transverse broadly oblong blade with a cleft in the anterior margin, bright canary-yellow, whitish beneath; crest thick, three-toothed, white spotted with red. Column with a light yellow apical toothed wing and a smaller one on each side of the stigma.

Oncidium ampliatum, Lindl. Gen. et Sp. Orch. p. 202 (1832). *Bot. Reg.* t. 1699 (1835). Fol. Orch. Oncid. No. 90. Van Houtte's *Fl. des Serres, XX.* t. 2140—41 (majus). Sander's *Reichenbachia, II.* t. 70.



Oncidium ampliatum.

Discovered by Cuming in 1831—2 near the Gulf of Nicoya, in Costa Rica, and introduced by Mr. Richard Harrison, of Liverpool, in whose garden it flowered in March, 1835. It was subsequently gathered by Mr. G. Ure Skinner, Warscewicz, Purdie and other collectors in various parts of Central America from Guatemala to the Isthmus of Panama, and whence it has since been frequently imported. It has also been detected in Trinidad, where herbarium specimens were gathered by Dr. Bradford in 1846; and in New Granada by Burke, who saw it growing on trees overhanging streams flowing into the Magdalena at 500—1,000 feet elevation in partial shade. The species is variable in the size of its pseudo-bulbs, leaves and inflorescence, and especially in the flowers, which sometimes exceed 1½ inches in diameter, but are frequently much less. The largest form, known in gardens as *ampliatum majus*, is a very handsome one on account of the singular purity of the yellow of its labellum. The usual flowering season of this species is April and May.

On. anthocrene.

Pseudo-bulbs oblong, 4—6 inches long, compressed, furrowed on the flattened sides, diphyllous. Leaves ligulate-oblong, acute, 9—12 inches long, 1½—2 inches broad. Peduncles arching, 2—4 feet long, racemed or panicled, many flowered. Flowers 1½—2½ inches in diameter; sepals and petals similar and sub-equal, oblong-lanceolate, much undulated, chestnut-brown, barred and margined with yellow, the petals brighter in colour than the sepals, the lateral sepals free and divergent; lip three-lobed, the side lobes small, oblong, yellow spotted with brown, the front lobe with a broad claw and obovate, cuspidate much undulated blade, light yellow with a broad red-brown band in front of the crest.

Oncidium anthocrene, Rchb. in Linnæa, XLI. p. 102 (1877). Williams' *Orch. Alb. IX.* t. 392.

A handsome species, not often seen in European collections, that was originally discovered by Gustav Wallis while collecting for us in New Granada in 1872—3, and subsequently by Chesterton, neither of whom divulged the locality in which it occurs. The above description was taken from one of Chesterton's plants that flowered in our houses several years ago. The specific name is a fanciful one, meaning "fountain of flowers," from ἀνθὸς, a flower, and κρηνὴ, a fountain.

On. aureum.

Pseudo-bulbs ovoid, elongated, 1—1½ inches long, mono-diphyllous. Leaves linear-lanceolate, 4—5 inches long. Scapes 15—21 inches long, erect, pale green, terminating in a 5—7 flowered raceme with a zig-zag rachis; bracts minute, glumaceous Flowers 1¼ inches across vertically; sepals and petals pale greenish yellow with a faint purplish tinge near the base, the dorsal sepal and petals oblong, acute, the lateral sepals longer, narrower and connate to the middle; lip bright golden yellow, the claw short and fleshy, the blade first quadrate then expanded, broadly oblong, retuse, apiculate, undulate, the upper surface finely corrugated; crest a cluster of small upright teeth with a small vertical cleft plate on each side. Column wings small, toothed.

Oncidium aureum, Lindl. Sert. Orch. sub. t. 25 (1839). Id. Fol. Orch. Oncid. No. 67 (1855). Rchb. in Walp. Ann. VI. p. 732 (1863). Odontoglossum festatum, Rchb. in Bonpl. II. (1854), Apr. 1. Od. hemichrysum, Rchb. in Bonpl. II. (1854), Apr. 15.

A very distinct species, first detected by Matthews on the high mountains near Andimarca in Peru, in 1838, and afterwards by Warscewicz near the sources of the Amazon. Both Lindley and Reichenbach have noted that in the specimens gathered by these collectors the labellum and its crest were somewhat different; in Matthews' type "the lip is as broad as long," in Warscewicz's "longer than broad." It is evidently the latter form that is now cultivated. We are indebted to Baron Schroeder, of The Dell, for materials for description.

On. auriferum.

Pseudo-bulbs ovoid, much compressed with acute edges, 2—2½ inches long, monophyllous. Leaves linear, sub-acute, 7—10 inches long. Peduncles longer than the leaves, glaucescent, loosely panicled, the branches short and few flowered. Flowers an inch across vertically; sepals and petals citron-yellow with 2—3 transverse pale brown bars, the dorsal sepal elliptic-oblong; the lateral sepals and petals longer and narrower, the former free; lip citron-yellow with a pale red blotch next the crest, three-lobed, the basal lobes small, oblong with revolute margin, the front lobe transversely oblong, deeply two-lobed with crenulate margin; crest a thickened triangular white ridge with two small teeth in front and three minute ones on each side. Column with a narrow wedge-shaped wing on each side of the stigma.

Oncidium auriferum, Rchb. in Linnæa, XXII. p. 847 (1848). Lindl. Fol. Orch. Oncid. No. 181 (1855).

Discovered by the Belgian collectors Funck and Schlim in 1846—7 on the mountains of Merida in Venezuela at 5,000—7,000 feet elevation, and occasionally imported since with other orchids from the same locality. It is very near *Oncidium panchrysum*, from which it may be distinguished by its more slender inflorescence with smaller flowers that are not self coloured. Materials for description were sent to us from the Royal Gardens at Kew, and by Mr. T. B. Haywood, of Woodhatch, Reigate.

On. barbatum.

Pseudo-bulbs oval-oblong, 2—2½ inches long, compressed, monophyllous. Leaves linear or oval-oblong, 3—4 inches long, acute or emarginate. Peduncles slender, pale green spotted with red-brown, loosely paniculate and few flowered at the extremity. Flowers about an inch in diameter; sepals clawed, oval-oblong, undulate, yellow blotched with chestnut-brown, the lateral two narrower, connate to one-third of their length; petals similar but broader; lip bright yellow, three-lobed, the lobes obovate and nearly equal, the lateral two obtuse, the intermediate one apiculate; crest dotted with red, seated on a circular disk that is fringed at the margin, five-toothed, the posterior two divergent, the anterior three smaller, tuberculose. Column wings roundish or sub-quadrate.

Oncidium barbatum, Lindl. Collect. Bot. t. 27 (1821-25). Id. Gen. et Sp. Orch. p. 200. Id. Fol. Orch. Oncid. No. 47. On. ciliatum, Lindl. in *Bot. Reg.* t. 1660 (1835). On. microglossum, Klotzsch, ex Lindl. Fol. Orch.

Discovered by Swainson in the neighbourhood of Rio de Janeiro, and sent by him to the Botanic Garden at Glasgow, at that time directed by Dr., afterwards Sir W. J. Hooker, where it flowered for the first time in 1819. It was afterwards cultivated by Mr. Cattley at Barnet, by Sir Charles Lemon at Carclew under the name of *Oncidium ciliatum,* by our predecessor at the Royal Exotic Nursery, Mr. Knight, and by Messrs. Loddiges of Hackney. It is now less frequently seen than formerly, being surpassed as a horticultural plant by other Oncids with more showy flowers. The species is a variable one, especially in the form and size of the front lobe of the lip, and in the colour of the sepals and petals, whence several varieties have been noted and distinguished by name. The specific name refers to the fringed or bearded disk on which the crest is seated.

On. Batemanianum.

Pseudo-bulbs ovoid or sub-conic, 3—4 inches long, obscurely angulate when old, di-triphyllous. Leaves linear-lanceolate, acute, 7—9 inches long. Peduncles 3—4 feet long, sparingly branched towards the extremity. Flowers 1¼ inches across vertically; sepals and petals much undulated, light yellow heavily barred and blotched with chestnut-brown, the dorsal sepal ovate, acute, bent forwards, the lateral two free, clawed, lanceolate, acute, reflexed; the petals broadly ovate, reflexed and twisted; lip bright yellow with two narrowly oblong basal auricles and a transversely roundish oblong blade with a broad sinus in the anterior margin; crest of complicated structure, consisting of four series of narrow plates, all more or less toothed; the back series including five plates in a compact row, the front series three, of which the middle one is the largest, the lateral series each consisting of two larger and two smaller teeth. Column with two ear-like wings.

Oncidium Batemanianum, Knowles and Westcott, Fl. Cab. III. p. 183, t. 137 (1840). Lindl. Fol. Orch. Oncid. No. 185 (1855). On. ramosum, Lindl. in Bot. Reg. XXIII. sub. t. 1920 (1837). On. spilopterum, Lindl. in Bot. Reg. 1844, misc. No. 76. Id. 1845, t. 40. On. Pinellianum, Journ. of Hort. Soc. Lond. 1848, p. 17, with fig. On. gallopavinum, in Ann. Gand. I. p. 18.

This handsome species was first cultivated in 1839 by Mr. George Barker, of Birmingham, who had obtained it from M. Parmentier at Paris. It was figured and described by Knowles and Westcott in their *Floral Cabinet* for 1840 without any indication of its habitat; it had, however, been previously described in the *Botanical Register* for 1837 by Lindley, under the name of *Oncidium ramosum,* from a panicle gathered by Martius in the Brazilian province of Minas Geraes, and subsequently it was figured in the same periodical for 1845 as *On. spilopterum,* from specimens received by Loddiges from Brazil, who also exhibited a plant at one of the Horticultural Society's meetings in 1848 as *On. Pinellianum.* All these names, which tend to show the variability of the species, were merged by Lindley when revising the genus for his *Folia Orchidacea* into Knowles and Westcott's *Batemanianum,* given in compliment to his friend the author of *Orchidacea of Mexico and Guatemala.*

Oncidium Batemanianum is a species with tall sparingly branched panicles of remarkably bright-coloured flowers, of which the crest of the labellum is of peculiarly complicated structure. Although tractable under cultivation it is now rarely seen in orchid collections. We are indebted to the Royal Gardens at Kew for materials for description.

On. Baueri.

Pseudo-bulbs oval-oblong, slightly compressed, 3—4 inches long, diphyllous. Leaves ensiform, acuminate, 10—15 or more inches long. Peduncles 5—7 or more feet long, branched from near the base, branches numerous, gradually shorter upwards, the lower ones 7—10 flowered. Flowers 1—1¼ inches in diameter; sepals and petals linear-lanceolate, undulate, yellowish green spotted with red-brown, the lateral sepals free and divergent; lip three-lobed, all the lobes yellow, the basal two small, obcordate, the front one transversely oblong, emarginate, broadly clawed, the claw red-brown with a fleshy whitish crest, consisting of three series of teeth, two lateral groups of four each and one of three teeth in front. Column with two short truncate wings.

Oncidium Baueri, Lindl. Gen. et Sp. Orch. p. 200 sub. On. altissimum (1832). Id. Fol. Orch. Oncid. No. 154. On. altissimum, *Bot. Reg.* t. 1651.

A species with a long straggling inflorescence that has been known to attain a length of 10 feet under cultivation, sometimes confused with *Oncidium altissimum,* from which it may be distinguished by its larger and smoother pseudo-bulbs, its longer and narrower leaves, and its smaller flowers with a differently-shaped labellum and crest. It is widely distributed over the West Indian Islands and adjacent parts of the South American continent, notably in British Guiana, where it was gathered by the brothers Schomburgk during their exploration of the colony in 1840-44.* It appears to have been first cultivated by Mr. Colville, of Chelsea, who received a medal for it from the Horticultural Society of London in 1833 under the name of *On. altissimum.* The species is dedicated to Francis Bauer, the eminent botanical draughtsman of that period.

On. bicallosum.

Pseudo-bulbs none. Leaves oblong-lanceolate, 8—12 inches long, complicate at base, keeled at the back, very leathery. Scapes stoutish, erect, longer than the leaves, usually racemose along the upper half, but sometimes branched, many flowered. Flowers about 2 inches across vertically; sepals and petals similar, obovate-spathulate with undulate margin, yellow toned with brownish green, the dorsal sepal concave, almost galeate, the lateral two narrower; lip bright canary-yellow, three-lobed, the basal lobes small, sub-spathulate; the front lobe large and spreading, transversely oblong with a shallow sinus in the anterior margin; crest white dotted with red, bipartite, the posterior part sub-reniform, the anterior part with three rounded tubercles. Column wings small, decurved.

Oncidium bicallosum, Lindl. in Benth. Plant. Hartw. p. 94 (1839). *Bot. Reg.* 1843, t. 12. Fol. Orch. Oncid. No. 135. *Bot. Mag.* t. 4148. *Illus. hort. XII.* t. 458.

A native of Guatemala. It was first detected by Mr. G. Ure Skinner, who sent plants to Woburn Abbey gardens and to Mr. Bateman, and afterwards by Hartweg while collecting orchids in Central America for the Horticultural Society of London. It flowered for the first time in this country in Mr. Bateman's collection at Knypersley in the autumn of 1842, and in the following year in the Royal Gardens at Kew, whither the Woburn collection of orchids had been removed. It is very near *Oncidium Cavendishianum*, from which it is distinguished by its larger and differently coloured flowers, and especially by the form of its column wings and crest, that of the latter suggesting the specific name.

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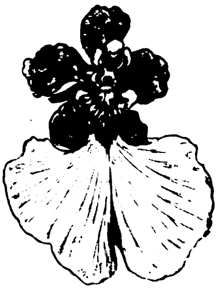
* Ueber die ganze Region verbreitet an den Ufern der Flüsse auf Baumstämmen. Blütht. in April und Mai. Reisen III. p. 913.

On. bifolium.

Pseudo-bulbs ovoid, about the size of a walnut diphyllous. Leaves linear-oblong, acute, 3—5 inches long. Scapes slender, glaucous, about a foot long, loosely racemose, 7—10 or more flowered. Flowers 1½ inches across vertically; sepals and petals small, oblong, undulate, yellow barred and spotted with red-brown, the two lateral sepals connate to the middle, and with acuminate, recurved tips; lip clawed, broadly transversely oblong with a sinus in the anterior margin, bright yellow; the claw with two small auricles and a crest consisting of four lamellæ, of which the posterior one is broad and tuberculated, the lateral two shallow and toothed, and the anterior one the most projected and having two small divergent teeth in front of it. Column wings narrow.

Oncidium bifolium, Sims in *Bot. Mag.* t. 1491 (1812). Loddiges, Bot. Cab. t. 1845. Lindl. Gen. et. Sp. Orch. p. 197. Id. Fol. Orch. Oncid. No. 73.

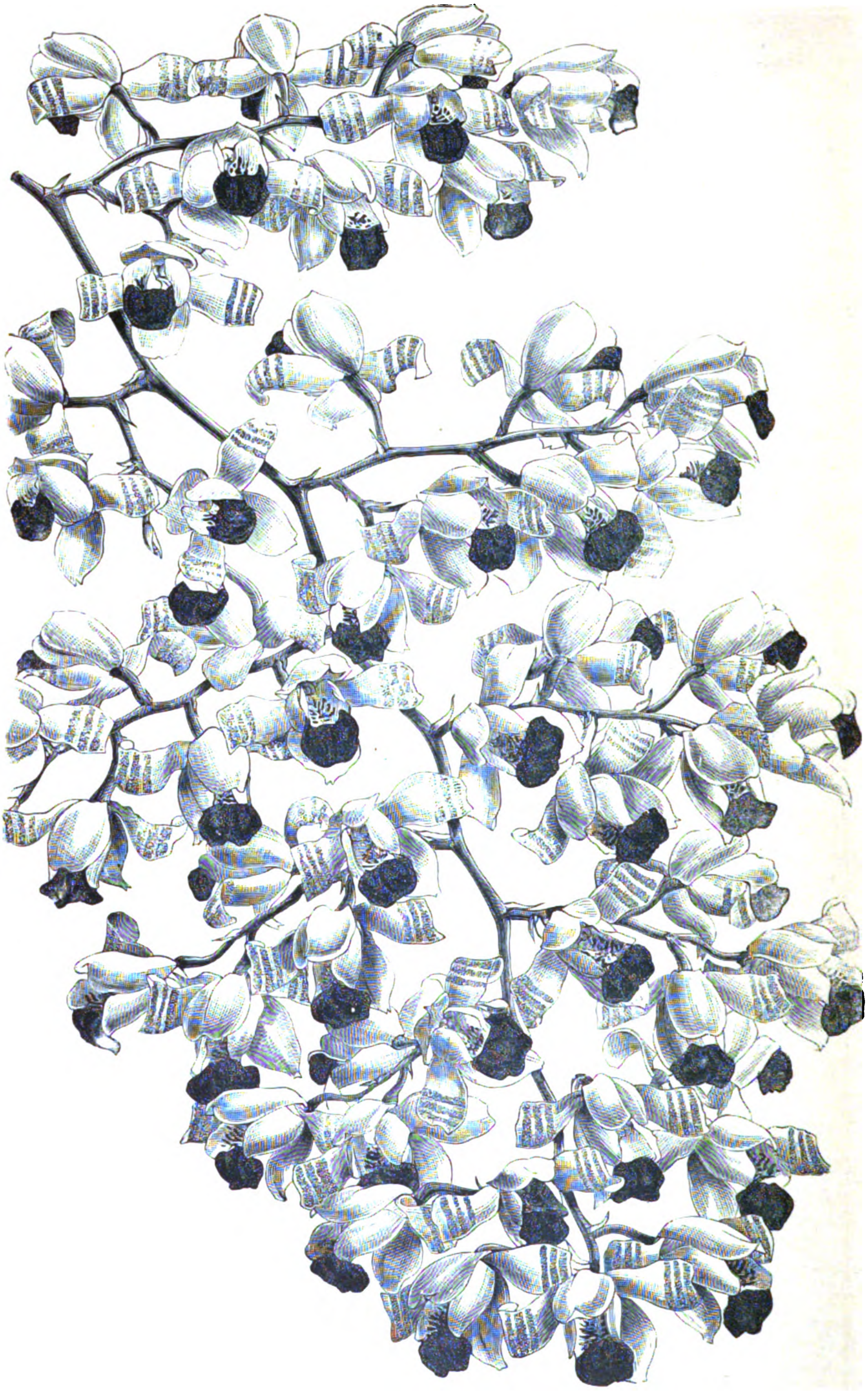
A somewhat diminutive but very attractive species that was first sent to Messrs. Loddiges, in 1812, by a gentleman who brought it from Montevideo; it is thence one of the earliest of the Oncids cultivated in this country. Its geographical position is noteworthy on account of its being one of the two most southern species of Oncidium known, the other being *Oncidium viperinum*; although its precise locality has not been indicated, it is known to inhabit the hills in the neighbourhood of Montevideo, whence it is occasionally imported.


Oncidium bifolium.

On. bracteatum.

Pseudo-bulbs oval-oblong, much compressed, 3 inches long and 1¼ inches broad, diphyllous, the two leaves linear-ligulate, usually if not always of unequal length, 8—12 inches long and an inch broad. Scapes 3—4 feet long, scabrous, the nodes 2—3 inches apart, at each of which is an acute pale brown spathaceous bract and a similar smaller one at the base of each pedicel, panicled towards the extremity, the branches short, 2—3 flowered. Flowers an inch across vertically; sepals and petals bright yellow-green densely spotted with blackish purple, the dorsal sepal and petals linear-oblong, acute, the lateral sepals longer and narrower, prominently keeled behind; lip broadly clawed with two minute basal auricles and a transversely oblong emarginate blade; claw red-brown, blade and auricles light yellow, white beneath; crest bluntly conical. Column wings very narrow.

Oncidium bracteatum, Rchb. in Bot. Zeit. 1852, p. 695. Id. in Walp. Ann. VI, p. 786. Lindl. Fol. Orch. Oncid. No. 139.



Oncidium Brunleesianum.

(From the *Gardeners' Chronicle*).

Discovered by Warscewicz in 1849—50 on Chiriqui in Veragua, growing on trees at 6,000—7,000 feet elevation. It is a very distinct species, easily recognised by its large spathaceous bracts. We are indebted to the Royal Gardens at Kew for materials for description.

On. Brunleesianum.

Pseudo-bulbs narrowly oblong, compressed, slightly attenuated upwards, 3—5 inches long, di-triphyllous. Leaves ligulate-oblong, acute, longer than the pseudo-bulbs. Peduncles 10—15 or more inches long, mottled with dull crimson, paniculate along the distal half, the branches alternate and distichous, 3—7 flowered. Flowers ¾ inch in diameter; sepals and petals bent forwards, pale yellow, the petals with some faint red transverse markings on the apical half, the dorsal sepal oblong, obtuse, the lateral two connate into an ovate sub-acute body, bifid at the tip; petals narrowly oblong, acute; lip sub-orbicular when spread out, three-lobed, the side lobes incurved towards the column, bright yellow, the intermediate lobe much smaller, reflexed, deep maroon-crimson, almost black; between the side lobes is a shallow lucid plate stained with purple and with two erect white teeth near the middle. Column terete, wings broad, roundish, anther hooded.

Oncidium Brunleesianum, Rchb. in Otia. Bot. Hamb. p. 87, ex. Gard. Chron. XIX. (1883), p. 340. Gard. Chron. I. s. 3 (1887), p. 672, with fig. Williams' *Orch. Alb. V.* t. 206.

A singular Oncidium, remarkable for the form and colour of its flowers, which are among the most distinct in the genus. It is an anomalous form, the most obvious structural peculiarities of which may be thus briefly summarised:—The sepals and petals are bent forwards, but in this it agrees with *Oncidium pubes*, the nearest allied species; the side lobes of the lip are turned inwards over the column like those of a Cattleya, and the front lobe is reflexed and richly coloured, as is often seen in that genus; the crest is reduced to a shallow plate with two small teeth; the usual protuberance below the stigma is absent.

The plant is as beautiful as it is curious. It was first introduced in 1879 by Mr. J. Brunlees, of Victoria Street, Westminster, who sent a portion of an inflorescence to the late Professor Reichenbach without, it appears, giving any indication of its origin. We transcribe from the *Gardeners' Chronicle* its subsequent history.

"In 1883 Mr. W. B. Lemon, of Moat Lodge, Beckenham, obtained through an engineer of Rio de Janeiro, a small parcel of mixed orchids,

> not necessarily collected at Rio,* among which was an Oncidium resembling *Oncidium sarcodes*, but which upon flowering proved to be a very different species. In 1885 it was awarded a First Class Certificate by the Royal Horticultural Society, and in February of the following year it again flowered in Mr. Lemon's collection, producing a densely branched panicle of upwards of 150 flowers. The main plant then passed into Baron Schroeder's collection at The Dell, a piece taken from it remaining with Mr. Lemon.† Sir Trevor Lawrence also has a plant of this rare Oncidium, and so far as we know, the three mentioned comprise the whole of it in England at the present day."‡

Since the publication of the foregoing extract the horticultural history of *Oncidium Brunleesianum* has remained materially the same. We have been informed, however, that two plants have been recently imported from Rio de Janeiro, one of which was sent to America.

The species is doubtless an extremely rare one in its native country. We are indebted to Baron Schroeder for materials for description.

On. cæsium.

Pseudo-bulbs clustered, sub-globose or broadly ovoid, 1—1¼ inches in diameter, of a peculiar olive tint, diphyllous. Leaves linear, acute, 6—7 inches long. Peduncles slender, erect, longer than the leaves, pale green mottled with dull crimson, usually terminating in a five-flowered, lax raceme. Flowers 1½ inches across vertically; sepals and petals greenish tinged with rose, shortly clawed, oval-oblong, the dorsal sepal the broadest, reflexed and with a green keel behind; lip bright canary-yellow, three-lobed, the basal lobes obliquely sub-quadrate with reflexed margins, the front lobe broadly clawed, transversely oblong with a deep cleft in the anterior margin; crest nearly circular in outline, obscurely five-toothed. Column wings hatchet shaped, spreading.

Oncidium cæsium, Rchb. in Regel's *Gartenfl.* 1854, t. 80. Id. Xen. Orch. I. p. 94, t. 36, fig. 2. Lindl. in Gard. Chron. 1854, p. 219. Id. Fol. Orch. Oncid. No. 159.

First cultivated in Herr Hofrath Keil's garden at Leipsig in 1853, and although it has since appeared at intervals in a few other orchid collections, its origin is unknown to science. Its nearest affinity is the better-known *Oncidium reflexum*, from which it is easily distinguished by its peculiarly coloured pseudo-bulbs, and the differently shaped auricles of the labellum. Our description was taken in the Royal Gardens at Kew. The application of the specific name is obscure; classically, *cæsium* relates to the eyes, thence greyish, greyish green, etc.

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* In Williams' *Orchid Album*, sub. t. 206, it is stated to be "a native of La Plata, having been gathered with a batch of *Oncidium varicosum* on the Rio de la Plata," but the statement does not appear to us to be supported by sufficient evidence.

† This has since passed into the collection at The Dell.

‡ I. s. 3. (1887), p. 672.

On. caminiophorum.

Pseudo-bulbs sub-orbicular, or broadly ovate, much compressed, 1½ inches long, and 1—1¼ inches broad, ribbed and furrowed on the flattened sides, monophyllous. Leaves linear-oblong, obtuse or obscurely emarginate, 3—5 inches long. Peduncles longer than the leaves, panicled, many flowered. Flowers an inch across vertically; sepals and petals similar and sub-equal, obovate-oblong, the basal half brown, the apical half yellow, the lateral sepals free and spreading parallel with the petals; lip sub-panduriform, the basal lobes rotund, yellow spotted with red, the front lobe transversely oblong, emarginate, bright yellow with a chestnut-brown band in front of the crest; crest quadrate, tuberculose with a curved ridge in front. Column wings small, truncate.

Oncidium caminiophorum, Rchb. in Bot. Zeit. 1852, p. 857. Lind. Fol. Orch. Oncid. No. 153.

Our knowledge of this species is derived solely from a plant in the Royal Gardens at Kew from which our description was taken. The flowers, although small, are remarkably bright in colour, and bear some resemblance, on superficial view, to those of *Oncidium reflexum*. *On. caminiophorum* was discovered by Wagener in the Caracas district about the year 1850, and introduced by him shortly afterwards into German gardens. The specific name is fanciful, or at the best but obscurely refers to the form of the crest; it is derived from *καμῖνος* (kaminos), "a furnace or hearth," and *φορὸς* (phoros), "bearing."

On. candidum.

Pseudo-bulbs narrowly oblong, compressed, 2 inches long, monophyllous. Leaves linear, acute, 9—12 inches long, complicate at base. Peduncles slender, erect, dull purple, longer than the leaves, 5—7 flowered. Flowers about an inch in diameter, milk-white; dorsal sepal oblong, acute, the lateral two concealed by the lip, connate and together of the same size and shape as the dorsal one; petals similar but broader; lip longer than the other segments, triangular-oblong, sub-acute; crest an obcordate yellow plate with several small tubercles on the surface. Column wings narrow, denticulate.

Oncidium candidum, Lindl. in Bot. Reg. 1843, misc. No. 76. Id. Fol. Orch. No. 52 (1855). Benth. et. Hook. Gen. Plant. III. p. 563. N. E. Brown in Gard. Chron. XX. (1883), p. 238. Palumbina candida, Rchb. in Walp. Ann. VI. p. 699 (1863). Id. in Gard. Chron. 1865, p. 793. *Bot. Mag.* t. 5546.

This very interesting species was discovered by Hartweg, in Guatemala, in 1840, while collecting orchids and other plants in that country for the Horticultural Society of London. It is supposed that most of the plants sent home by him perished, as there is no record of any of them having flowered except one that was acquired by Messrs. Loddiges, and which flowered in their nursery in 1843; on the breaking up of their collection a few years later, this plant passed into the hands of Consul Schiller, of Hamburgh.* We find no further mention of this Oncidium till 1865, when a plant flowered in the collection of the late Mr. John Day, by whom it was exhibited at one of the Royal Horticultural Society's meetings in June of that year, and this plant was figured in the *Botanical Magazine.* The species is better known in European gardens under the name of *Palumbina candida* than under that of *Oncidium candidum.*

The botanical history of *Oncidium candidum* is curious. Dr. Lindley never saw the plant that flowered in Messrs. Loddiges' nursery; the only evidence he possessed of it was a drawing which must have been inaccurately executed, as it represented the caudicle (stipes) double with four pollinia; he therefore doubtfully referred it to Oncidium, adding that "until it shall have been re-examined it is safest to leave it where it stands."† Assuming the structure as represented by this drawing to be correct, Reichenbach founded upon it the genus Palumbina,‡ and yet, with Consul Schiller's plant previously at hand, and which had been acquired at his request, he, two years later, re-publishes in the *Gardeners' Chronicle* his genus Palumbina, one of its distinguishing characteristics being described thus: Caudicula pollinis (*sic*) utriusque caudiculæ tertiæ communi inserta," an expression we are unable to understand, as no such structure is observable in the pollinary apparatus of the flower. The true structure is clearly shown by Mr. N. E. Brown in the *Gardeners' Chronicle loc. cit.*, and whose accurate drawings of the details of the flower are here reproduced by the courtesy of the publisher. We have since been able to verify the correctness of these floral details from an examination of flowers produced in our houses.

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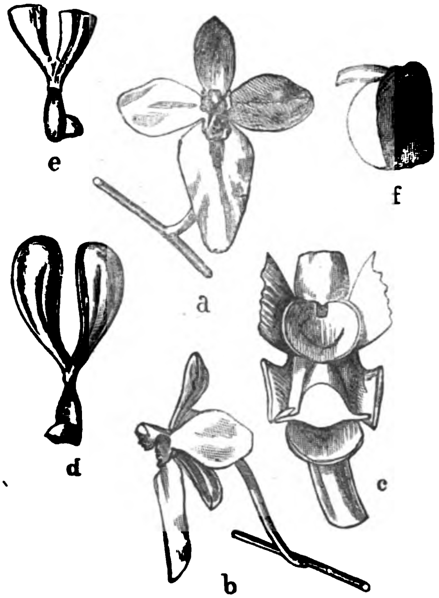
* Reichenbach in Gard. Chron. 1865, p. 793.

† Fol. Orch. Oncid. No. 53. ‡ Walp. Ann. VI. p. 699.

The plant was properly restored to Oncidium by Mr. Bentham in the *Genera Plantarum,* and Reichenbach's Palumbina must now disappear from the list of genera.



Oncidium candidum.

a, front view; b, side view of flower; c, column x 4; d, pollinia x 12; e, caudicle gland and lower part of pollinia x 12; f, side view of gland and part of the caudicle x 40.

On. carthaginense.

Pseudo-bulbs none. Leaves coriaceous, erect, oblong, acute, keeled behind, 9—12 or more inches long and 2½—3½ inches broad, dull dark green sometimes spotted with red. Scapes 3—5 feet long, purplish with numerous short branches each bearing 2—5 or more flowers. Flowers about an inch in diameter, with reflexed crisped segments, usually white, more or less blotched with purplish rose; sepals and petals clawed, oval-oblong; lip sub-panduriform, the basal lobes oblong, obtuse, the front lobe transversely oblong with a shallow sinus in the anterior margin; crest with five tubercles, of which the central and two front ones are simple, the posterior two complex. Column wings spreading, rose colour.

Oncidium carthaginense, Swartz in K. Vet. Acad. Stockh. Nya. Hand. XXI. p. 240 (1800). Lindl. Gen. et Sp. Orch. p. 201 (1832). Id. Fol. Orch. Oncid. No. 130. Rchb. in Walp. Ann. VI. p. 781. Id. Xen. Orch. I. p. 236, t. 99, No. 3. On. sanguineum, Lindl. *Sert. Orch.* t. 27 (1838). On. Huntianum, *Bot. Mag.* t. 3806 (1841). On. luridum Henchmanii, Knowles and Westcott, *Fl. Cab.* t. 97 (1840). On. Oerstedii, Rchb. in Bonpl. 1854. Epidendrum undulatum, *Bot. Mag.* t. 777 (804).

This Oncidium occurs in various parts of Central America as far north as the Real del Monte, in Mexico, especially in the neighbourhood of the Caribbean Sea; it also occurs in Jamaica and other West Indian Islands. Dispersed over so extensive an area, the species is found to be a variable one as regards the size and colour of its flowers, whence have originated the numerous names that have been given to it. The adopted specific name is derived from Cartagena, on the Caribbean coast of New Granada, from its having been first detected by the French botanist Jacquin, about the middle of the last century, in the dense forests in the vicinity of that port. Towards the end of that century it was gathered by Swartz in Jamaica, and many years afterwards by Oersted in Nicaragua, by G. Ure Skinner in Guatemala, by Purdie near Santa Martha, by Wagener in Caracas, and by other botanical travellers in other localities. It is one of the five species upon which Swartz founded the genus Oncidium; it is also interesting as being one of the first Oncids cultivated in British gardens, it having flowered in the garden of Mr. Edward Woodford at Vauxhall, in May, 1804, when it was figured for the *Botanical Magazine.*

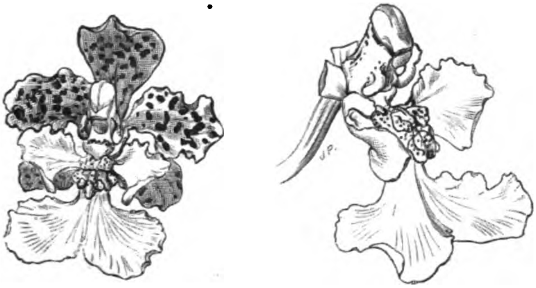
On. Cavendishianum.

Pseudo-bulbs none. Leaves from a stout rhizome, very coriaceous, elliptic-oblong, sub-acute, 7—10 or more inches long, and 2—3 inches broad, keeled at the back. Scapes stoutish, erect, 24—36 inches high, terminating in a many-flowered panicle. Flowers fragrant, about 1½ inches in diameter, much undulated; sepals and petals sometimes wholly yellow, sometimes yellow-green spotted with red, clawed, obovate, the petals a little narrower than the sepals; lip bright yellow, three-lobed, the side lobes obovate, the front lobe transversely oblong with an angular sinus in the anterior margin; crest with four tubercles in the form of a cross, and a fifth central one that is larger and more prominent than the others. Column wings curved, yellow spotted with red.

Oncidium Cavendishianum, Batem. Orch. Mex. et. Guat. t. 8 (1840). Lindl. Fol. Orch. Oncid. No. 134. On. pachyphyllum, Hook. in *Bot. Mag.* t. 3807 (1841). Godefroy's *Orchidophile*, 1888, p. 241.

Discovered by Mr. G. Ure Skinner in the neighbourhood of the city of Guatemala, and one of the first orchids sent to England by that gentleman, it being included in his first consignment to Mr. Bateman at Knypersley in 1835. A few years later plants were sent by Mr. Parkinson, the British Consul in Mexico, to the

Woburn collection, where one of them flowered in 1841, and from that time to the present frequent mention is made of it in the horticultural periodicals. It was collected by Roezl in 1875 near Colima, in the Mexican provinces of Michoacan,* thus indicating that it is spread over a considerable area in the neighbourhood of the Pacific coast. *Oncidium Cavendishianum* is one of a small group including that last described, distinguished by the absence of pseudo-bulbs and by their large thick leathery leaves, a group of which we have already made mention in our introductory notes. It was named by Mr. Bateman in compliment to the then Duke of Devonshire, the most munificent patron of horticulture of his time, and under whom the late Sir Joseph Paxton commenced the modern system of orchid culture at Chatsworth. Its usual flowering season is April and May.



Oncidium Cavendishianum.

On. Cebolleta.

Leaves from a stout rhizome, sub-cylindric, elongate, tapering to a point, grooved on the face, 6—15 or more inches long. Peduncles longer than the leaves, stiffish, erect, spotted with crimson, loosely paniculate, many flowers. Flowers variable in size, the best forms 1—1½ inches in diameter; sepals and petals undulate, dull yellow spotted with reddish brown, the former clawed, obovate-oblong, the latter linear-oblong; lip canary-yellow, three-lobed, the side lobes obovate-oblong, the intermediate lobe transversely oblong, emarginate; crest an elevated rounded plate, behind which are two large teeth and some smaller ones on each side. Column wings small.

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* La Belgique Horticole, 1882, p 96.

Oncidium Cebolleta, Swartz in K. Vet. Acad. Stockh. Nya. Handl. XXI. p. 240 (1800). Lindl. Gen. et. Sp. Orch. p. 206 (1833). Id. Fol. Orch. Oncid, No. 42. *Bot. Reg.* t. 1994. *Bot. Mag.* t. 3568. On. juncifolium, Lindl. Collect. Bot. p. 27 (1821 –25). On. longifolium, Lindl. in Bot. Reg. 1841, misc. 56, and 1842, t. 4. Epidendrum Cebolleta, Jacquin. E. juncifolium, Linn. Sp. Pl. 1351.

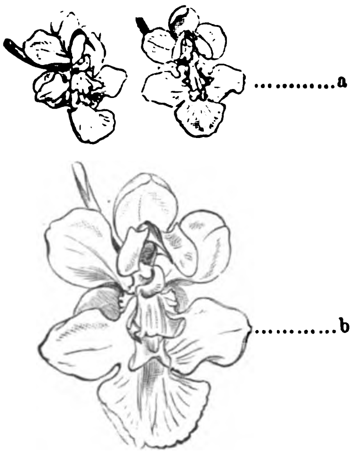
One of the first Oncids known to science, and so far as at present known, the most widely dispersed species in the genus. It was first discovered by Jacquin in the forests of Cartagena, about the same time as he discovered *Oncidium carthaginense,* and in common with that species it is one of the five upon which Swartz founded the genus Oncidium. In more recent times it has been gathered by Hartweg in Mexico, by Spruce in the Brazilian province of Para, by various collectors in the West Indies, and within the last few years it has been sent from Paraguay with *On. Jonesianum*; its dispersion is thence almost conterminous with the geographical distribution of the genus. Over such an extensive region it is not surprising that it should vary, more or less, in some of its characteristics, a circumstance to which it owes its many synonyms. The earliest notices we find of its flowering in this country are in Messrs. Low's nurseries at Clapton in 1837, in the Botanic Garden at Glasgow in the following year, and shortly afterwards in Mr. Horsfall's collection at Liverpool. *On. Cebolleta,* as already mentioned in our introductory notes, is the typical species of the section TERETIFOLIA, distinguished by their rounded tapering leaves; the specific name is the Spanish word for a small onion.

On. cheirophorum.

Pseudo-bulbs ovoid-orbicular, quite smooth, much compressed, about an inch in diameter, monophyllous. Leaves linear, acute, 3—6 inches long. Peduncles slender, usually longer than the leaves, nodding, densely paniculate with short branches, many flowered. Flowers ½ inch in diameter, bright buttercup-yellow, the crest of the lip much paler, sometimes whitish; sepals and petals sub-equal, orbicular-obovate, concave; lip three-lobed, the lobes variable, the lateral two orbicular or oblong, the intermediate one usually broader than long, emarginate; the crest a central ridge, two-lobed in front, and with two lateral plates at the posterior end. Column wings large, dolabriform; anther beaked.

Oncidium cheirophorum, Rchb. in Bot. Zeit. X. (1852), p. 695. Id. *Xen. Orch. I.* p. 191, t. 69, fig. 1. Lindl. Fol. Orch. Oncid. No. 124. *Bot Mag.* t. 6278. Regel's *Gartenfl. XXII.* t. 827. Godefroy's *Orchidophile,* 1885, p. 102. *Lindenia, III.* t. 126.

Discovered by the Polish botanical traveller and collector, Warscewicz, in 1848—9, on the volcano of Chiriqui in Veragua, growing upon oaks at 8,000 feet elevation, and introduced by him to the gardens of Senator Jenisch and Consul Schiller, near Hamburgh, where it flowered for the first time in Europe in 1852. At the altitude at which this Oncid grows Warscewicz observed that the temperature frequently falls during the night to 4°—7° C. (40°—45° F.), a circumstance which suggests cool treatment in the glass-houses of Europe. The specific name "Wallflower-bearing" refers to the resemblance of the colour of the flowers to that of species of Cheiranthus. *Oncidium cheirophorum* is well known as one of the prettiest of the small-flowered Oncids, and one of the most tractable under cultivation.



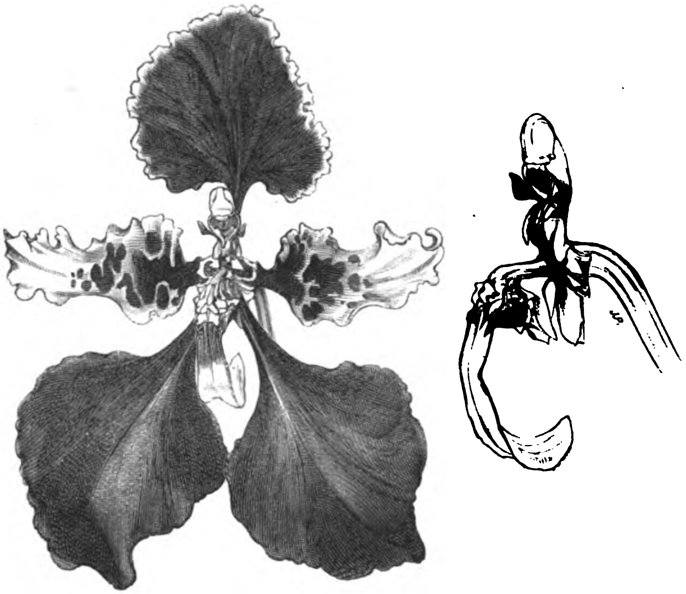
Oncidium cheirophorum.
a, natural size; b. enlarged.

On. chrysodipterum.

Pseudo-bulbs oblong, compressed, 3 inches long, mono-diphyllous. Leaves broadly strap-shaped, sub-acuminate, cuneate at base, 15—20 inches long. Scape flexuose, 7—9 or even more feet long, with short branches at irregular intervals, each bearing 3—5 or more flowers. Flowers 3 inches across vertically; sepals with a semi-terete claw grooved on the face and slightly reflexed, the dorsal sepal cordate-orbicular, undulate at the margin, bright chestnut-brown with a narrow yellow border; the lateral two divergent, broadly ovate, sub-acute, keeled behind, wholly brown; petals much smaller with a shorter claw, ovate-lanceolate, incurved and strongly undulated at the margin, bright gamboge-yellow spotted with brown on the basal half only; lip linear, reflexed, yellow stained with brown in front of the crest, with two triangular deflexed auricles at the base; crest a semi-terete white plate produced in front into numerous yellow teeth in five series of twos and threes. Column brownish with a small hastate wing on each side of the stigma and two linear deflexed auricles below it.

Oncidium chrysodipterum, supra.

A remarkably handsome Oncid acquired by us at one of the London orchid sales, and which, when it flowered in our houses in the spring of 1891, we were unable to refer to any species known to us. It is very near *Oncidium serratum* and *On. lamelligerum*, from both of which it differs in its petals, crest, and column, but like them it is doubtless of Andean origin. The original plant is now in the fine collection of the Hon. F. L. Ames at North Easton, Massachusetts. The specific name, literally "golden wings," refers to the petals, which are exceptionally bright and attractive.



Oncidium chrysodipterum.

On. chrysomorphum.

Pseudo-bulbs ovoid, 1½ inches long, compressed, smooth, with very acute edges, di-triphyllous. Leaves linear, sub-acute, 7—9 inches long, coriaceous. Scapes stoutish, erect, 18—21 inches high, panicled from the middle, the branches distichous and alternate, short and curved downwards; bracts spathaceous, sheathing ½ inch long. Flowers numerous, crowded, ¾ inch in diameter; sepals and petals similar and sub-equal, reflexed, spathulate, obtuse, golden yellow; lip lighter in colour than the other segments, oblong, dilated both at the base and at the apex into two roundish lobes; crest nearly oblong, with two teeth in front and two on each side. Column wings obsolete.

Oncidium chrysomorphum, Lindl. Fol. Orch. Oncid. No. 188 (1855). Rchb. in Walp. Ann. VI. p. 811. Id. in Gard. Chron. VIII. (1877), p. 358.

A very distinct species of which we find but little recorded beyond the intimation that it is a native of the Caracas region, and that it was gathered by Purdie in the extreme north of New Granada. It appears to have been first cultivated by the late Serjeant Cox, at Mill Hill, in 1877, flowering in the winter months. We are indebted to Mr. F. W. Moore, of Glasnevin, for materials for description.

On. chrysopyramis.

Pseudo-bulbs oval-oblong, 1½—2½ inches long, compressed with acute edges, diphyllous. Leaves linear-ligulate, sub-acuminate, 5—6 inches long. Peduncles slender, arching 18—24 inches long, loosely paniculate, many flowered. Flowers about ¾ inch across vertically, of a uniform canary-yellow; upper sepal and petals clawed, oblong, apiculate, concave, keeled behind; lateral sepals free, linear-oblong, falcate, keeled behind; lip panduriform with a deep cleft in the anterior margin; crest with three projecting teeth in front and two bipartite lateral ones between which is a minutely tuberculose cushion. Column wings falcate, two-lobed, bent over the anther and denticulate at the outer edge.

Oncidium chrysopyramis, Rchb. in Bonpl. 1854, May 1. Lindl. Fol. Orch. Oncid. No. 98.

One of Warscewicz's discoveries on the Andes of Ecuador or Southern New Granada about the year 1852, and since occasionally imported with other orchids from the same region. Our description is from a plant that flowered in our houses in June, 1889. It is very near the better known *Oncidium pyramidale*, "from which it differs in having much smaller flowers, a thinner and weaker panicle, and very narrow two-lobed column-wings."*

On. concolor.

Pseudo-bulbs oval-oblong, 1½—2 inches long, ribbed, di-triphyllous. Leaves lanceolate-ligulate, acute, 6 inches long. Peduncles drooping, as long again as the leaves, usually racemed and many flowered. Flowers about 2 inches across vertically, bright canary-yellow; dorsal sepal and petals elliptic-oblong, acute, the lateral sepals longer, narrower and more acute, connate to about half their length; lip clawed, the blade spreading, orbicular or broadly cordate, emarginate; crest bi-lamellate. Column wings tooth-like, ascending.

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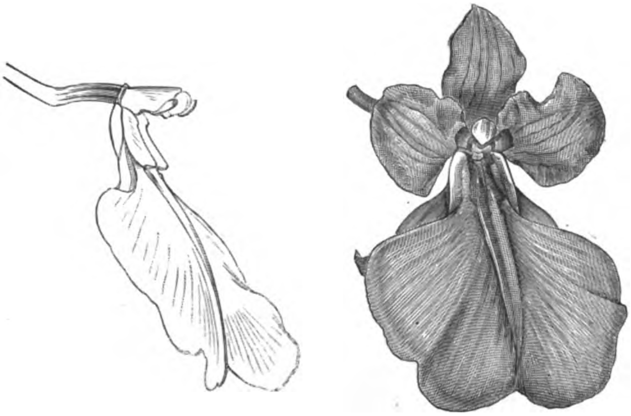
* Lindley, Fol. Orch. Oncid. No. 97.

Oncidium concolor, Hook. *Bot. Mag.* t. 3752 (1840). Lindl. Fol. Orch. Oncid. No. 65 (1855). *The Garden, XIII.* (1878), t. 111. Williams' *Orch. Alb. I.* t. 1. *Rev. hort.* 1881, p. 30. *Illus. hort.* s. 3, t. 487. Sander's *Reichenbachia I.* t. 30. *Lindenia V.* t. 205. On. unguiculatum, Klotzsch, ex. Lindl. Fol. Orch. Cyrtochilum citrinum, *Bot. Mag.* t. 4454 (1849).

Discovered by Gardner on the Organ Mountains in 1837, and sent by him to the Woburn collection, where it flowered in 1840; it was subsequently gathered by Sellow and Glaziou, both of whom sent herbarium specimens to Europe, but it continued to be very rare in European gardens till 1876, in which year we received a consignment of plants from a correspondent at Rio de Janeiro. The drooping racemes of self-coloured flowers of the purest yellow render this species one of the most admired in the genus; its flowering season is April and May.



Oncidium concolor.

On. cornigerum.

Pseudo-bulbs sub-cylindric, compressed, 2—3 inches long, monophyllous. Leaves elliptic-oblong, sub-acute, 3—5 or more inches long. Scapes slender, arching or pendulous, 15—24 inches long, pale green dotted with dull crimson, with an acute, striated, closely appressed bract at each joint, much branched along the distal half. Flowers somewhat crowded, about $\frac{3}{4}$ inch in diameter; sepals and petals yellow spotted and barred with red-brown, the dorsal sepal obovate-oblong, concave, bent forward over the column, the lateral sepals oblong, connate to beyond the middle; petals clawed, obovate, obtuse; lip panduriform, bright yellow, the basal lobes small, horn-like, turned upwards and inwards, the front lobe roundish oblong with crenulate margin; crest bipartite, the posterior part bi-lamellate, the anterior part much tubercled. Column wings spreading, linear-triangular.

Oncidium cornigerum, Lindl. in *Bot. Reg.* t. 1542 (1832). Id. Gen. et Sp. Orch. p. 199. (1833). Id. Fol. Orch. Oncid. No. 55. *Bot. Mag.* t. 3486. On. chrysorapis, Rchb. in Gard. Chron. III. s. 3 (1888), p. 72.

First cultivated in 1830 by Dean Herbert, who had received plants from Brazil, one of which he presented to Earl Fitzwilliam, in whose collection at Wentworth Woodhouse it flowered in perfection in 1835, and was then figured in the *Botanical Magazine*. It was subsequently gathered by Miers near Rio de Janeiro, by Gardner on the Serra do Mar, by Weir in 1861—2 in the province of San Paulo while collecting for the Royal Horticultural Society of London, and it has since been occasionally very sparingly imported with other orchids from these localities. The specific name, "horn-bearing," refers to the basal lobes of the labellum.

On. crispum.

Pseudo-bulbs oblong, compressed, 3—4 inches long, brownish ribbed and furrowed on the flattened side, di-triphyllous. Leaves oblong-lanceolate, 6—8 inches long, 1—2 inches broad. Scapes 30—45 inches long, glaucescent, mottled with dull crimson and green, loosely paniculate, rarely racemose. Flowers with all the segments much crisped and undulated, variable in size, 2—3 inches in diameter, bright chestnut-brown sometimes spotted and margined with yellow, and nearly always with a bright yellow spot in front of the crest; sepals clawed, oval-oblong, the lateral two connate to about one-third of their length and hidden by the lip; petals broadly oval or sub-orbicular with a short claw and crenulate margin; lip three-lobed, the basal lobes auriculate, the anterior lobe large, with a broad claw and sub-orbicular blade; crest tri-lamellate, the front lamella much the largest, horn-like, the posterior two multi-dentate. Column wings large, toothed.

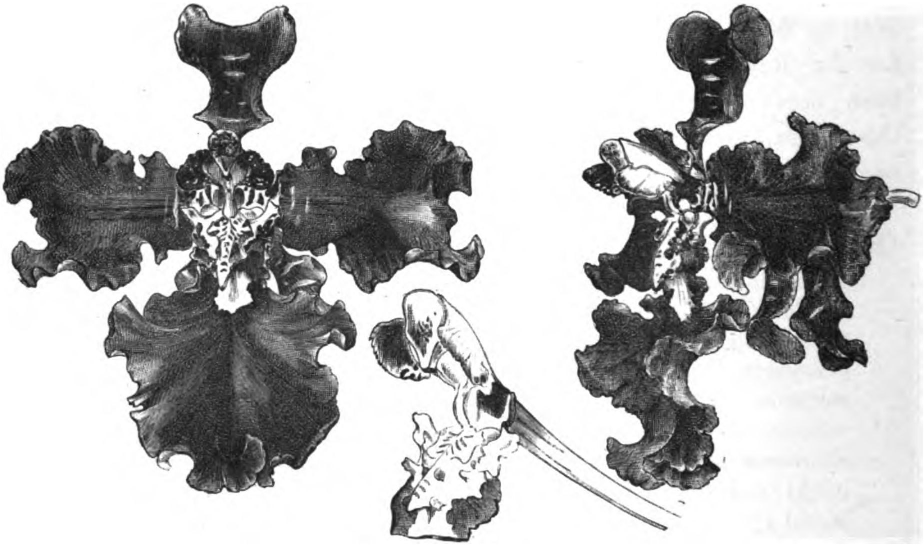
Oncidium crispum, Lodd. Bot. Cab. t. 1854 (1832). Lindl. Gen. et. Sp. Orch. p. 197 (1833). Id. *Bot. Reg.* t. 1920 (1837). Id. Fol. Orch. Oncid. No. 161. *Bot. Mag.* t. 3499. Warner's *Sel. Orch. II.* t. 26. Van Houtte's *Fl. des Serres, XXI.* t. 2147—8. Fl. Mag. t. 485 (grandiflorum). Gard. Chron. X. s 3 (1890), p. 422.

The early history of this superb species is thus briefly sketched by Dr. Lindley:—

"The first notice I had of the existence of this species was the finding in the Herbarium of Sir William Hooker, a drawing and one single dried flower of it which had been sent from the Organ Mountains in Brazil, with a memorandum that from fifty to sixty flowers frequently

> grow on a stalk. A small specimen of it shortly after flowered with Messrs. Loddiges, and it has subsequently blossomed in many collections, but never with the vigour that it possesses in the wild state." *

Among the earliest cultivators of *Oncidium crispum* were Mrs. Horsfall and Mr. Richard Harrison, of Liverpool, whose commercial relations with Rio de Janeiro offered facilities for obtaining many of the finest orchids found in its neighbourhood, of some of which they were the first introducers. Since their time this beautiful Oncid has been imported by thousands, but only to display its splendid inflorescence for a very few times, and, perhaps, in numerous cases, only once, and then to perish, so intractable has it hitherto proved under cultivation. As stated in the above description the flowers vary in size and colour, the most distinct deviation known to us in the last named character being the sub-variety *flavum,* in which the flowers are deep yellow with the central area of each segment paler.



Oncidium crispum.

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* Bot. Reg. sub. t. 1920. The inferior flowers Dr. Lindley here complains of might have resulted from the exhaustion of the plants during transit, which at that period occupied three times as long as at present.

On. cryptocopis.*

"Pseudo-bulbs lanceolate, much compressed, 4—5 inches long and an inch broad. Leaves a foot long, lanceolate, acute. Panicle 3—5 feet long, much branched, slender, with sheathing, lanceolate, scarious bracts; pedicels flexuous, 3—5 inches long, also bracteate. Flowers 3 inches across the tips of the sepals, pale chestnut with golden crisped margins of the sepals and petals and a broad yellow middle lobe of the lip; upper sepal deltoid-ovate with a short broad claw; lateral sepals parallel, much longer than the upper, with long claws and an obovate cuneate limb; petals ovate-lanceolate with broad claws; lip about half as long as the petals, reflexed; lateral wings small, hatchet-shaped, recurved; middle lobe consisting of a long flat claw and a transversely oblong blade turned completely back; crest tuberculose. Column with two small spreading wings and two subulate decurved horns in front."—*Botanical Magazine.*

Oncidium cryptocopis, Rchb. in Gard. Chron. 1870, p. 827. *Bot. Mag.* t. 5858.

One of the MICROCHILA group of Oncids imported by Mr. William Bull, of Chelsea, from the Andes of Peru in 1869 along with *Oncidium serratum,* with which it is comparable as regards the size and colour of its flowers, and apparently distinct from that species in the form of its petals and the structure of the labellum which is peculiar. It flowered in May, 1870, in Mr. Bull's nursery, but we find no record of its being in cultivation since. The specific name, from κρυπτὸς (kruptos), "hidden," and κοπὶς (kopis), "a dagger," refers to the dagger-like wings below the stigma.

On. cucullatum.

Pseudo-bulbs ovoid, sometimes oval-oblong, 1½—3 inches long, compressed, mono-diphyllous. Leaves linear-ligulate, acute, 6—8 inches long, complicate at base. Scapes slender, erect or nodding, purplish green, 15—24 inches high, loosely panicled, sometimes racemed along the distal half, 8—12 flowered. Flowers about 1¼ inches across vertically, variable in colour; sepals and petals similar, oval-oblong, acute, the lateral sepals concealed by the lip, connate, bifid at the tip, deep chestnut-brown, sometimes greenish or olive-green and not unusually with a narrow yellow margin; lip light rose-purple spotted in various ways with purple-crimson, three-lobed, the side lobes small, roundish, the front lobe large and spreading, transversely oblong, emarginate; crest with two pairs of tubercles and a fifth smaller one between the posterior pair, bright orange-yellow. Column thickish hooded.

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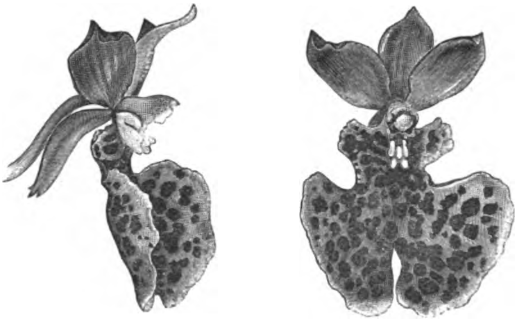
* Not seen by us.

Oncidium cucullatum, Lindl. Sert. Orch. sub. t. 21 (1838). Id. Fol. Orch. Oncid. No. 69. Paxt. *Fl. Gard. III.* t. 87 (1852—3). *Belg. Hort.* 1869, p. 337, pl. 19. Van Houtte's *Fl. des Serres, VIII.* t. 835. *Id. XXIII.* t. 2457. *The Garden, XXII.* (1882), t. 350 (giganteum). *Lindenia, II.* t. 81. Leiochilus sanguinolentus, Lindl. in Bot. Reg. 1844, misc. 91.*



Oncidium cucullatum.

var.—macrochilum.

Leaves and racemes longer, the latter flexuose and many flowered; lip broader than in all the *cucullatum* forms, wholly purple.

On. cucullatum macrochilum, Lindl. Fol. Orch. Oncid. No. 69 E.

var.—nubigenum.

Plant smaller in all its parts; sepals and petals variable in colour, generally light greenish brown, sometimes with a pale margin; lip narrow at the base with the middle lobe almost sessile, white with a violet spot in front of the three-tubercled crest.

On. cucullatum nubigenum, Lindl. Fol. Orch. Oncid. No. 69 D. *Bot. Mag.* t. 5708. On. nubigenum, Lindl. Gen. et Sp. Orch. p. 197 (1833).† Rchb. in Gard. Chron. 1867, p. 376. *Belg. Hort.* 1869, p. 337.

var.—Phalænopsis.

Pseudo-bulbs somewhat smaller and more ovoid, the leaves narrower, the scapes more slender and generally fewer flowered than in the commoner *cucullatum* forms, and the flowers differently coloured; sepals and petals milk-white barred with deep purple; lip white with slight flush of rose-purple and with some dark purple spots around the crest.‡

On. cucullatum Phalænopsis, supra. On. Phalænopsis, Rchb. in Gard. Chron. 1869, p. 416. *Illus. hort.* 1870, t. 3. Williams' *Orch. Alb. II.* t. 96. *Lindenia II.* t. 123.

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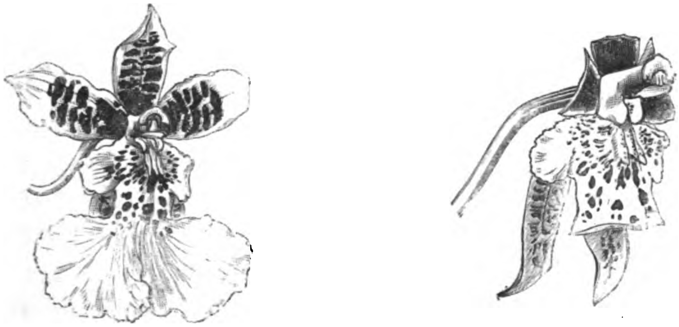
* Evidently described from an abnormal form said to have been sent from La Guayra, but which Lindley himself afterwards referred to *Oncidium cucullatum.* The locality too is doubtful.

† It will be seen from our literary references that Lindley's *nubigenum* is an older name for this species than *cucullatum*, or in other words, the var. *nubigenum*, supra, is the typical form. It is usual when one species, or one that was at first assumed to be such, is reduced to a variety of another, for the holder of the two to be retained as the specific name. In this case Lindley, unintentionally perhaps, reversed the usual practice; but as his specific name *cucullatum* is accepted by other eminent orchid authorities, we do not feel justified in disturbing the nomenclature.

‡ The distinction between this and the preceding variety is not very clear; practically it is a difference of colour only, the variety *nubigenum* being intermediate in this respect between *On. cucullatum* and the variety *Phalænopsis.*

sub-vars. (distinguished by colour only).—*andigenum* (Gard. Chron. 1869, p. 416), sepals and petals pale yellow, dotted with purple, lip white heavily blotched with purple; *Dayanum* (Gard. Chron. 1872, p. 539), name only; *olivaceum*, sepals and petals deep olive-brown, lip light rose-purple spotted with deep purple; *spathulatum* (Fol. Orch. Oncid. No. 69 C.), racemes nodding, many flowered, sepals and petals spotted with purple, lip spotted only at the base.

The botanical history of this beautiful Oncid is made up of a number of fragmentary notes dispersed in a very irregular manner throughout the horticultural and botanical literature of the last sixty years, these fragments being in most cases of a very meagre description, and not infrequently contradictory. It is scarcely possible to make a connected narrative out of them, and the best that can be done is to bring them together into a kind of chronological order.



Oncidium cucullatum, var. Phalænopsis.

The species first became known to science through Dr. Jamieson, a Scotch botanist, who obtained a professorship in the university of Quito a few years after the Spanish South American colonies had established their independence. In 1831—2 Dr. Jamieson sent dried flowers to Sir W. J. Hooker, which he had gathered from plants growing on the decaying trunks of trees at 11,000—13,000 feet elevation on Asuay, one of the higher eminences of the Ecuadorian Andes, and from these Dr. Lindley described the species in his *Genera and Species of Orchidaceous Plants* under the fanciful name of *nubigenum*, or "cloudborn," in allusion to the altitude at which the plant was found. Ten years later Linden discovered an Oncidium in the forests of Quindiu, on the central Cordillera of New Granada, and sent living plants to Europe, one of which flowered in the collection of Mr. Thomas Brocklehurst at Macclesfield, in February, 1842, and to which Lindley gave the name of *cucullatum,* in reference to the hooded anther,* and which he subsequently adopted as the type. *Oncidium cucullatum* was afterwards gathered by Schlim, a Belgian collector, at Las Vetas, in the state of Pamplona on the eastern Cordilleras, at 9,000—10,000 feet elevation, and near Ocaña at a somewhat less altitude; by Purdie on the Sierra Nevada of Santa Martha, at 7,500—9,000 feet; by Lehmann on Potaré, in the state of Cauca, at 9,000 feet elevation; and by other collectors in various localities, but always at a considerable elevation.

Some time after its first discovery Jamieson again gathered the original form, the variety *nubigenum* supra, on the western slopes of Pichincha, at 8,000—9,000 feet, and Hartweg and William Lobb found it in the same locality in 1842. The merit of first introducing it to British gardens is due to Messrs. Backhouse, of York, who imported it from Ecuador in 1867—68, and about the same time it was collected for M. Linden's horticultural establishment at Brussels by Gustav Wallis, in whose consignment first appeared the beautiful variety *Phalænopsis,* and another named by Reichenbach *andigenum.* The variety *nubigenum* has since been detected by Lehmann on the western slopes of Chimborazo, at 8,000—10,000 feet elevation.

It is thence evident that *Oncidium cucullatum,* in the collective sense here used, is strictly an alpine plant inhabiting the cooler regions of the Andes from the equator northwards to the Caribbean Sea, and growing under conditions which no available horticultural appliances can approach. It has been imported in great quantities during the last thirty years, and the many plants that have recently flowered in our houses afford ample evidence of the great variability of the species as regards the colour of its flowers, and in a much less degree, some trifling deviations in structure, but in no case sufficient to justify the splitting up of one of the most distinct types of Oncidium known into a number of so-called species, all of which are connected by intermediate forms. Of the sub-varieties, those enumerated above have been distinguished by a separate name, but there are many others of equal merit that might be distinguished in like manner for horticultural use.

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* This character is not peculiar to this species.

On. curtum.

Pseudo-bulbs oblong, 3 inches long, diphyllous. Leaves ligulate, acute, 6—12 inches long. Scapes 24—36 or more inches long, loosely panicled, many flowered. Flowers 2 inches in diameter; sepals clawed, oval-oblong, obtuse, chestnut-brown more or less barred with bright yellow, the dorsal one concave, the lateral two connate to one-third of their length and hidden by the lip; petals oval-oblong, emarginate, wavy, broader than the sepals, chestnut-brown margined with yellow; lip with two small oblong yellow auricles at the base and a fan-shaped emarginate blade, bright yellow with a broad margined zone of chestnut-brown spots; crest consisting of an erect central rounded plate with two smaller plates behind, all warted, two rounded teeth in front and numerous warts on each side. Column wings small, truncate.

Oncidium curtum, Lindl. in *Bot. Reg.* 1847, t. 68. Id. Fol. Orch. Oncid. No. 36.

Introduced by us from the Organ Mountains in Brazil, in 1841—2, through William Lobb, whence it has been sparingly imported since. Like most Oncids the species is variable in the colour of its flowers, which sometimes closely resemble those of the much later introduced *Oncidium prætextum,* but from which *On. curtum* may be easily distinguished by the very different crest of the lip and often by its much brighter colours. The specific name *curtum,* "shortened," refers to the truncate wings of the column.

On. dasytyle.

Pseudo-bulbs about the size of a walnut, compressed, ancipitous and furrowed when old, mono-diphyllous. Leaves linear-lanceolate, sub-acute, 5—6 inches long. Scapes slender, 12—18 inches long, racemose or paniculate, few flowered. Flowers 1½ inches in diameter, the dorsal sepal and petals sub-equal, elliptic-lanceolate, acuminate, pale yellow blotched with red-brown; the lateral sepals connate to the middle, longer than the dorsal one and of a duller colour; lip pale yellow, clawed and auriculate at the base, the blade large, broadly reniform; crest cordiform, two-lobed, blackish crimson. Column wings sub-quadrate, anther beaked.

Oncidium dasytyle, Rchb. in Gard. Chron. 1873, pp. 253, 432. *Bot. Mag.* t. 6494.

First introduced by the late Mr. B. S. Williams, of Holloway, who imported it in 1872 from the Organ Mountains along with other well-known Oncids from that region. It is one of the prettiest of the winter-flowering species; its dark-coloured crest is peculiar, to which its specific name refers, and which is derived from δασὺς (dasus), "thick," and τύλη (tulè), "a callosity."

On. divaricatum.

Pseudo-bulbs sub-orbicular, very much compressed, almost discoid, 1—1½ inches in diameter, monophyllous. Leaves narrowly oblong, 9—12 inches long, very coriaceous. Peduncles dull purple mottled with pale green, 4—6 feet long, much branched, the branches slender, many flowered. Flowers an inch in diameter; sepals and petals clawed, chestnut-brown with a golden yellow blotch at the apex, the sepals obovate, the dorsal one concave, the lateral two divaricate; the petals longer, oblong, obtuse; lip three-lobed, the side lobes the largest, sub-orbicular entire, yellow spotted with chestnut-brown; the intermediate lobe transversely oblong, emarginate, yellow with a chestnut spot in front of the crest; crest cushion-like, four-lobed. Column wings rounded.

Oncidium divaricatum, Lindl. in *Bot. Reg.* t. 1050 (1827). Id. Gen. et. Sp. Orch. p. 205 (1833). Id. Fol. Orch. Oncid. No. 119. Paxt. *Mag. Bot. III.* p. 4 (1837).

One of the first of the Brazilian Oncids cultivated in Great Britain, and one of the most tractable under cultivation. It first became known to science in the early part of the present century through the French traveller, Descourtilz, who detected it growing on the trunks of large trees on the Serra das Argoas in the district of Ilha Grande, and at Corcovado near Rio de Janeiro. It was introduced to British gardens by Mr. Heatherly, the British Vice-Consul at Rio de Janeiro, who sent plants to the Horticultural Society of London, one of which flowered for the first time in the Society's garden at Chiswick in October, 1826. It was subsequently imported by Loddiges, Knight and other horticultural firms.

Oncidium divaricatum is one of a group of Oncids including four species forming Lindley's sub-section *Pulvinata,* characterised chiefly by the papillose cushion-like crest of the lip. The other three are *On. sphegiferum, On. pulvinatum,* and *On. Harrisonianum.* These members of the *Pulvinata* group may thus be distinguished from each other:—

In *On. divaricatum* the crest is distinctly four-lobed, the lateral lobes of the lip flat and entire.

In *On. sphegiferum* the crest is oblong and entire, the side lobes of the lip denticulate.

In *On. pulvinatum* the crest is circular, the side lobes of the lip fimbriate; and generally, the leaves are broader than those of the other three species.

In *On. Harrisonianum* the crest is five-toothed, and the habit and aspect of the plant very different from all the others.

The variability in the colour of the flowers of *Oncidium divaricatum* was observed when the species was first introduced, one form being wholly brown or coppery red, but which is now rarely seen.

On. euxanthinum.

"Pseudo-bulbs ellipsoid, flattened, 2—3 inches long, diphyllous. Leaves linear-ensiform, acute, 8—10 inches long. Scapes slender, drooping, with a broad, many-flowered panicle longer than the leaves. Flowers about an inch in diameter, bright golden yellow with some red dots on the disk of the lip and bars across the sepals and petals; dorsal sepal obovate, obtuse, arching over the column; lateral sepals united into an obovate bifid body with acute lobes; petals longer than the sepals, oblong undulate; lip shortly clawed, three-lobed, the lateral lobes orbicular, the mid-lobe reniform, much broader than long, with an acute sinus in the anterior margin; crest with several warts in a transverse line and a prominent conical horn and other smaller warts." —*Botanical Magazine.*

Oncidium euxanthinum, Rchb. in Gard. Chron. 1869, p. 1158. *Bot. Mag.* t. 6322.

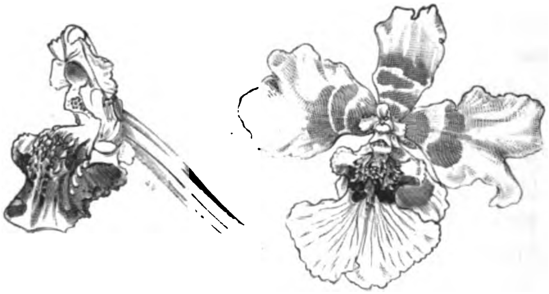
A very pretty Oncid, allied to *Oncidium bifolium*, but distinguished from that species by its larger pseudo-bulbs, broader leaves, panicled inflorescence, and especially by the very different crest of the labellum. It was imported by us from Brazil in 1869, the locality not being communicated by the collector; the plate in the *Botanical Magazine* was drawn from a plant that flowered in our houses in the autumn of 1871. It appears to be now lost to cultivation, but its dwarf habit and bright coloured flowers should cause it to be sought for by collectors.

On. excavatum.

Pseudo-bulbs ovate-oblong, compressed, 3—5 inches long, monophyllous. Leaves linear-ligulate, 12—20 inches long. Scapes stoutish, glaucescent, 2—3 feet long, paniculate, many flowered. Flowers 1½ inches in diameter; sepals undulated, yellow with 2—3 red-brown bars on the basal half, the dorsal one obovate-oblong, the lateral two narrower and free, oval-oblong; petals also undulated, larger than the sepals, obovate-oblong, emarginate, sometimes wholly yellow, sometimes with 1—2 red-brown spots near the base; lip three-lobed, the basal lobes small, oblong, convex, red-brown, the front lobe transversely oblong, emarginate, bright canary-yellow; crest convex, studded with small tubercles arranged in five lines, and with a decurrent shallow plate on each side. Column wings roundish, retuse.

Oncidium excavatum, Lindl. Sert. Orch. sub. t. 25 (1838). Id. Bot. Reg. 1839, misc. No. 150. Id. Paxt. Fl. Gard. I. sub. t. 21. Id. Fol. Orch. Oncid, No. 85. *Bot. Mag.* t. 5293. On. aurosum, Rchb. in. Bonpl. I. 1854 (May). *Illus. hort.* 1870, t. 34. *Lindenia, V.* t. 221.

A very handsome species, first discovered by Matthews, in 1838, at Chachapojas in Northern Peru, and afterwards by Spruce on the Andes of Ecuador, and by Warscewicz near the sources of the Amazon. It flowered in Messrs. Loddiges' nursery at Hackney in 1839, but we find no further record of its being in cultivation till 1862, when it flowered in the collection of the late Mr. Thomas Dawson, at Meadowbank, near Glasgow, who had obtained it at a sale, and on which occasion it was figured in the *Botanical Magazine.* It was again figured in the *Illustration horticole* for 1870, under the name of *Oncidium aurosum,* from plants collected by Gustav Wallis, in 1865, in southern Ecuador, and sent by him to M. Linden's horticultural establishment at Brussels. Since that date it has been generally cultivated, and has proved to be very variable in the size and colour of its flowers.



Oncidium excavatum.

The specific name *excavatum* was suggested to Dr. Lindley "by a deep pit excavated on the under side of the labellum near the base, and only to be seen by looking at the back of the flower and putting aside the two lateral sepals."

On. falcipetalum.

Pseudo-bulbs ovate-oblong, 3—4 inches long, diphyllous. Leaves variable in size, ligulate, or lanceolate-ligulate, acute, 12—15 or more inches long and 1—2 inches broad. Peduncles stoutish, flexuous, several feet long, branched at irregular intervals, each branch bearing 3—5 flowers; bracts oblong, acute, ½ inch long. Flowers 2½—3 inches in diameter; sepals russet-brown with a narrow yellow margin, clawed, the dorsal one orbicular, the lateral two ovate, acute; petals much smaller, falcate, acute, the margins much undulated, yellow spotted with brown on the basal half; lip linear, reflexed, purplish brown; crest a narrow ridge, in front of which is a cluster of sharp tubercles. Column with a horn-like wing on each side of the stigma.

Oncidium falcipetalum, Lindl. in Orch. Linden. No. 76 (1846). Id. Fol. Orch. Oncid. No. 7.

One of the most distinct of the *serratum* group of MICROCHILA Oncids; its narrow, sickle-like petals and cluster of sharp-pointed tubercles on the front part of the crest mainly distinguishing it from its congeners. Like them it is a native of the Andes at a considerable elevation, but towards their northern limits only and within the Venezuelian territory. It was detected by Funck near Merida, and afterwards by Wagener and Fendler near Tovar, in the province of Caracas. We find no record of its first introduction into British gardens; it flowered in our houses in the autumn of 1886.

On. fimbriatum.

Pseudo-bulbs narrowly oblong, diphyllous. Leaves linear or ligulate-oblong, acute. Scapes 2—3 feet long, drooping, slender, pale green spotted with dull purple, loosely paniculate, many flowered; bracts acute, appressed, ½ inch long, greyish white. Flowers about ¾ inch in diameter; sepals and petals spreading, bright yellow barred and streaked transversely with red, the dorsal sepal ovate-oblong, concave, the lateral two free, linear-oblong, acute; petals clawed, oblong, obtuse; lip sub-panduriform, the basal lobes auriculate, the front lobe sub-reniform with minutely fimbriate margin, wholly yellow; crest bipartite.

Oncidium fimbriatum, Lindl. Gen. et Sp. Orch. p. 199 (1832). Id. Fol. Orch. Oncid. No. 54. Rchb. in Gard. Chron. XI. (1879), p. 298. Rolfe in Gard. Chron. V. s. 3 (1889), p. 584.

A Brazilian species that became known to Dr. Lindley some time prior to 1832 through a drawing of a single flower in the portfolio of the botanical artist Francis Bauer, and which is now preserved in the British Museum. Nothing more appears to have been heard of it till June, 1878, when Mr. Kramer, of Flotbeck, near Hamburgh, submitted an inflorescence of an Oncidium to the late Professor Reichenbach, which he identified as Lindley's *Oncidium fimbriatum,* from a tracing which he had made of Bauer's drawing. We have no evidence of its being in cultivation in British gardens before the spring of 1889, when we received a large panicle loaded with flowers accompanied by a photograph of the plant from Mr. O. O. Wrigley, of Bridge Hall, Bury, Lancashire, which proved to be this rare species. Both inflorescence and photograph are now in the Herbarium at Kew.

On. flexuosum.

Rhizome ascending, stoutish, clothed with imbricating pale brown scales and emitting dense fascicles of white thread-like roots from below the pseudo-bulbs which are produced at intervals of 1—2 inches. Pseudo-bulbs oval-oblong, 1½ – 2½ inches long, compressed, mono-diphyllous. Leaves linear- or lanceolate-oblong, acute, 4—7 or more inches long. Scapes 24—36 inches long, usually dull purple, paniculate at the extremity, the branches and their ramifications wiry, flexuose, and many flowered. Flowers variable in size, ¾—1¼ inches across vertically, bright yellow with a red-brown blotch at the base of all the segments; sepals and petals minute, similar, obovate-oblong, the lateral sepals connate, bifid at the apex; lip clawed, with two basal auricles and a transversely oblong, emarginate blade; crest bipartite, the posterior half a downy cushion, the anterior half usually 3—5 toothed. Column wings subquadrate, bent forward.

Oncidium flexuosum, Sims in *Bot. Mag.* t. 2203 (1821). Lodd. Bot. Cab. No. 424. Lindl. Gen. et Sp. Orch. p. 199. Id. Fol. Orch. Oncid. No. 81. Rchb. in Gard. Chron. 1872, p. 358 (radiatum).

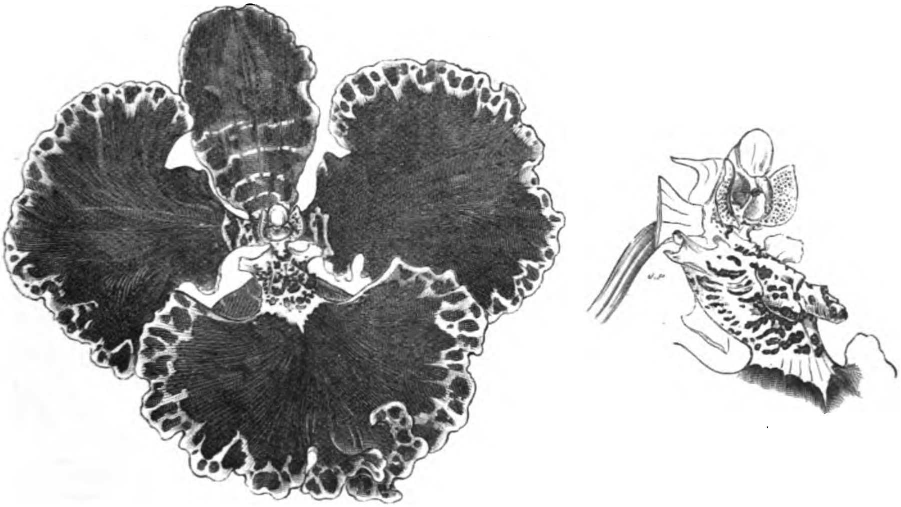
A well-known bright-coloured Oncid that has been in cultivation during the greater part of the present century, it having been introduced from Brazil by Messrs. Loddiges about the year 1820. The only localities we find for it are—the Organ Mountains where it was gathered by Gardner, and Bahia where it was collected by Blanchet. *Oncidium flexuosum* is easily distinguished by its creeping rhizome, and the flexuose wiry branches of its inflorescence; it is probably the most easily cultivated species in the genus.

On. Forbesii.

Pseudo-bulbs oblong, 2—3 inches long, compressed, mono-diphyllous. Leaves oblong-ligulate, acute, sometimes mucronate, 6—10 or more inches long. Scapes mottled with dull purple and green, 18—36 inches high, panicled, rarely racemed. Flowers 2—2½ inches in diameter, all the segments bright chestnut-brown with a narrow golden yellow border; upper sepal broadly oval, the lateral two narrowly oblong, connate to one-third of their length and concealed by the lip; petals clawed, sub orbicular, with crisped margin; lip broadly clawed with two, usually bright yellow auricles at the base and a large fan-shaped, two-lobed blade; crest warty, five-lobed. Column wings roundish, purplish violet spotted with red.

Oncidium Forbesii, Hook. *Bot. Mag.* t. 3705 (1839). Lindl. Fol. Orch. Oncid. No. 60. Williams' *Orch. Alb. III.* t. 104. Rchb. in Gard. Chron. XI. (1879), p. 524, figs. 71 and 72. *Lindenia IV.* t. 164.

One of the handsomest of the genus, and often called from the yellow border of all the floral segments the "gold-laced Oncid." It was discovered by Gardner on the Organ Mountains in 1837, and sent by him to the collection of the Duke of Bedford at Woburn, where it flowered in October of the following year, and after whose gardener, Mr. Forbes, it was named by Sir William Hooker.



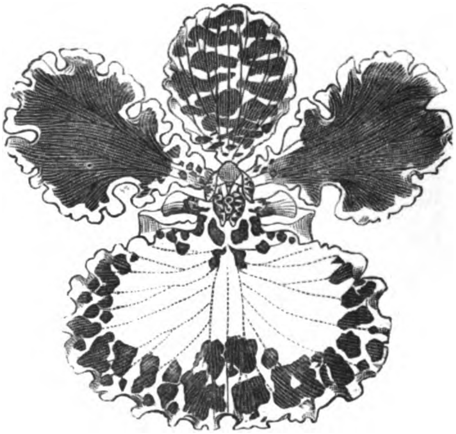
Oncidium Forbesii.

On. Gardneri.

Pseudo-bulbs ovoid, 2—3 inches long, much compressed and furrowed longitudinally when old, diphyllous. Leaves linear- or oblong-lanceolate, obtuse, 6—9 inches long, dark green above, often purplish beneath. Scapes 18—36 inches long, with a small sheathing pale bract at each joint and at the base of each pedicel, panicled along the distal half, many flowered. Flowers about 2 inches in diameter; sepals clawed, obovate-oblong, brown barred with yellow, the dorsal one concave, the lateral two connate to beyond the middle; petals much larger, shortly clawed, sub-orbicular with undulate margin, chestnut-brown with numerous yellow markings along the margin; lip spreading fan-shaped with two small auricles at the base, bright yellow with a broad zone of red-brown confluent spots next the undulate margin; crest a fleshy triangular body with the apex in front studded with red-brown warts, on each side of the apex are two warty protuberances. Column wings narrow roundish.

Oncidium Gardneri, Lindl. in Lond. Journ. Bot. II. p. 662 (1843). Id. in Bot. Reg. 1847, sub. t. 66. Id. Fol. Orch. Oncid. No. 57. Williams' *Orch. Alb. I.* t. 12. *Fl. Mag.* N.S. t. 401. Gard. Chron. XVI. (1881), p. 86, icon. xyl. On. flabelliferum, Paxt. *Mag. Bot. XVI.* p. 65. On. prætextum, Morren in *Belg. hort.* 1877, p. 357, not Rchb.

Very little is recorded of the botanical history of this beautiful Oncid. It was discovered by Gardner on the Organ Mountains about the same time as *Oncidium Forbesii*, but it does not seem to have been introduced with it; it was probably first cultivated by Messrs. Rollisson, who received plants from M. Pinel in 1846. Its appearance in British gardens at long intervals and in limited quantity would imply that it is a rare plant in its native country; it was dedicated to its discoverer by Dr. Lindley.* Very near *On. Gardneri* and probably still more rare is *On. amictum*, figured in the *Botanical Register* for 1847; this fine species had been introduced a short time previously by Messrs. Loddiges; it is here mentioned with the view of preserving it from oblivion.



Oncidium Gardneri.
(From the *Gardeners' Chronicle.*)

On. graminifolium.

"Pseudo-bulbs ovoid, compressed, 2—3 inches long, diphyllous. Leaves grass-like, linear-lanceolate, acute, 7—9 inches long. Scapes slender, flexuose, 3—5 feet long, loosely panicled, many flowered. Flowers 1½—2 inches across vertically; sepals and petals similar and sub-equal, the lateral sepals free and spreading, ovate-oblong, acuminate, yellow blotched with chocolate-brown; lip bright yellow, scarcely lobed and somewhat unguiculate, broadly obovate with a deep

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**See* Part VI. Cœlogyne, p. 42.

cleft in front and with an obscurely crenulate margin; crest an elevated keeled ridge with three acute lobes. Column wings roundish." —*Botanical Magazine.*

Oncidium graminifolium, Lindl. Sert. Orch. sub. t. 48 (1838). Id. Fol. Orch. Oncid. No. 110. On. filipes, Lindl. Sert. Orch. sub. t. 48. On. Wrayæ, Hook. *Bot. Mag.* t. 3854 (1841). Cyrtochilum filipes, Lindl. *Bot. Reg.* 1841, t. 59.

A distinct but somewhat variable species that has probably not been seen in British collections for some years past, although from the many localities in which it has been gathered it cannot be assumed to be a rare species, and may therefore be expected to appear at any time among importations of Central American Oncids. It was originally sent by Mr. G. Ure Skinner from Guatemala to Mr. Bateman, and subsequently to the Horticultural Society of London by Hartweg, who found it on the mountains of Oaxaca, at 8,000—9,000 feet elevation; it was afterwards gathered by Galeotti at San Pedro, Nolasco, Talea, and other places in southern Mexico.

On. hæmatochilum.

Pseudo-bulbs none. Leaves oblong, acute, 9—12 inches long, very leathery, dull green spotted with reddish brown. Scapes dull purplish red, 15—24 inches long, panicled above, many flowered. Flowers 2 inches in diameter; sepals and petals clawed, yellow-green heavily blotched with chestnut-brown; the dorsal sepal sub-orbicular, the lateral two free, oblong; petals obovate-oblong, undulate: lip broadly clawed with two oblong auricles at the base, the blade transversely oblong, emarginate; the claw, auricles and crest dark rose-purple, the blade sanguineous red with a yellow margin spotted with red; crest five-partite, of which the middle one is a raised sub-triangular plate, the others much tuberculated. Column wings kidney-shaped, bent downwards, rose-purple.

Oncidium hæmatochilum, Lindl. in Paxt. *Fl. Gard. I.* t. 6 (1850). Id. Fol. Orch. Oncid. No. 182. Williams' *Orch. Alb. I.* t. 32.

First imported in 1847 by Messrs. Loddiges from New Granada, it is said, and since that date it has appeared at intervals in various orchid collections in Great Britain; its habitat is, however, virtually unknown to science. Its nearest affinity is *Oncidium Lanceanum*, from which the differently shaped crest of the labellum chiefly distinguishes it. The specific name is derived from *αἷμα*, "blood," and χεῖλος, "a lip."

On. Harrisonianum.

Pseudo-bulbs orbicular, generally compressed and disk-like, about an inch in diameter, monophyllous. Leaves linear-oblong, 3—6 inches long, recurved, fleshy, glaucous green densely spotted with grey. Scapes slender, about a foot long, panicled beyond the middle. Flowers numerous and somewhat crowded, ¾ inch in diameter; sepals and petals oblong or obovate-oblong, bright yellow blotched with red, the lateral sepals free; lip three-lobed, the basal lobes auriculate, spotted with red, the front lobe clawed, transversely oblong, wholly yellow; crest consisting of five erect teeth, of which the four outside ones are roundish, the central one much narrower and horn-like. Column wings deltoid.

Oncidium Harrisonianum, Lindl. Gen. et Sp. Orch. p. 202 (1832). Id. in *Bot. Reg.* t. 1569 (1833). Id. Fol. Orch. Oncid. No. 120. On. pallidum, Lindl. in Bot. Reg. 1840, misc. No. 108.

Discovered on the Organ Mountains by Mr. William Harrison, and sent by him to his relative, Mrs. Arnold Harrison, of Liverpool, in whose collection it flowered in October, 1832. It was subsequently found by Martius on the Serra de Piedade, in the province of Minas Geraes. It is a dwarf species with bright flowers, easily distinguished by its glaucous pseudo-bulbs and recurved leaves, and especially by the remarkable crest of its labellum.

On. hastatum.

Pseudo-bulbs ovoid, 3—4 inches long, compressed ancipitous, usually with 2—3 shallow ridges on each of the flattened sides, mono-diphyllous. Leaves oblong-lanceolate, 6—9 inches long. Scapes pale green, sometimes mottled with dull crimson, 4—5 feet long, paniculate, with short distant branches each bearing 3—4 or more flowers. Flowers 1½ inches in diameter; sepals and petals stellate, lanceolate, acute, chocolate-brown bordered and barred with light yellow-green; lip three-lobed, the lateral lobes white or light yellow, the intermediate lobe halberd-shaped, claret-red passing into yellow-green at the apex; crest consisting of two parallel keels terminating in two teeth and with two smaller lateral teeth. Column wings rounded, white.

Oncidium hastatum, Lindl. in Paxt. Fl. Gard. I. p. 5 (1851). Id. Fol. Orch. Oncid. No. 192. On. stelligerum, Rchb. in Gard. Chron. 1873, p. 1398. Odontoglossum hastatum, Batem. *Orch. Mex. et Guat.* t. 20 (1843). Od. phyllochilum, Morren in Ann. Gand. t. 271.

sub.-vars.—*atratum* (Fol. Orch. Oncid. No. 192 B.) lip claret-red; *flavescens* (Id. No. 182 A), lip straw-yellow; *M. Roezl's* (Gard. Chron. VI. (1876), p. 36), side lobes of lip pale yellow, the middle lobe rose-pink; *Mr. Wilson's*, side lobes of lip white, the middle lobe rose-pink bordered with white.

Oncidium hastatum was first introduced from Mexico, in 1837, by Messrs. Loddiges, from whom Mr. Bateman obtained materials for figuring and description in his *Orchidaceæ of Mexico and Guatemala*, which he completed in 1843. Very little is recorded of it during the forty years that followed its introduction; it is incidentally noticed by Dr. Lindley in Paxton's *Flower Garden* for 1851, on the occasion of its being figured by M. Morren in a Belgian periodical, under the name of *Odontoglossum phyllochilum*, adding that "it is an old inhabitant of English gardens, where it has long been known under the name of *Oncidium hastatum*." It continued to be very rare in British gardens till it was imported in quantity by Messrs. Low and Co. in 1875, and about the same time a large number of plants were sent to Europe by Roezl, who collected them in the neighbourhood of Colima near the Pacific coast, where this orchid is very abundant.

The aspect of *Oncidium hastatum* when in flower is remarkable; its long loose panicles over which its star-like flowers are not very thickly scattered are made attractive by the surprising variety of colours, some of strong contrast, to be seen in each flower. We know of no orchid in which this peculiarity is more apparent.

On. heteranthum.

Pseudo bulbs ovoid, 2 inches long, much compressed, smooth and ancipitous, diphyllous. Leaves linear, acute, 3—5 inches long. Scape 3—4 feet long, branched almost from the base, the branches 3—5 inches long, the lower ones with a slender zigzag rachis and a short secundary branch from each node. Flowers numerous, but all aborted except the terminal one on each primary branch, the aborted flowers consisting of five filiform, reflexed whitish segments, the perfect flowers $\frac{3}{4}$ inch in diameter; sepals and petals cream-white with two—three broad brown bars, the sepals linear-oblong, the petals broader, oval-oblong; lip somewhat lyre-shaped, constricted near the truncate apex, the basal part red-brown, the apical part yellow; crest consisting of about nine tubercles arranged in three transverse rows of two, four, and three. Column hooded.

Oncidium heteranthum, Poeppig et Endl. Nov. Gen. et Sp. I. p. 34, t. 60, ex Lindl. Fol. Orch. Oncid. No. 187 (1855).

A curious species first detected by the German botanist, Poeppig, on the Andes of Bolivia more than half a century ago, and where it was shortly afterwards gathered by Matthews. As will be seen from the above description, the terminal flowers of the primary branches of the panicle only are perfect, all the others being reduced to thread-like segments longer than the organs they represent. This peculiarity also occurs in a more irregular manner in *Oncidium abortivum*, a native of Caracas.

We are indebted to Mr. O. O. Wrigley, of Bridge Hall, Bury, Lancashire, for materials for description.

On. hians.

Pseudo-bulbs about the size of a hazel nut, slightly compressed and ancipitous, monophyllous. Leaves varying from oval to linear-oblong, acute, 1—2 inches long, leathery and slightly glaucous. Scapes slender, almost filiform, purplish, 9 or more inches long, few flowered. Flowers of peculiar structure and appearance, about ½ inch in diameter; sepals and petals quite uniform, narrowly oblong, red-brown with a yellow margin; lip obscurely lobed, linear-spathulate, emarginate, yellow with some red-brown spots; crest white, very large in proportion to the size of the lip, four-lobed, erect. Column wings large, sub-quadrate, white.

Oncidium hians, Lindl. in Bot. Reg. 1838, misc. No. 124. Id. Fol. Orch. Oncid. No. 122. Regel's *Gartenfl.* 1888, t. 1250.

One of the most curious species of Oncidium that has ever come under our notice, although not one that will receive much favour from amateurs. The structure of the crest is peculiar, and which Dr. Lindley not inaptly likened to the four fingers of the hand hollowed out and closed together; this extraordinary organ is as long as the column and parallel with it, the two together having the fanciful resemblance of a gaping mouth which suggested the specific name.* It was first introduced in 1838 from the vicinity of the gold mines in Brazil (Ouro Preto?) by Messrs. Rollisson of Tooting, but it seems to have been lost to cultivation for many years. It was sent to the Imperial Botanic Garden at St. Petersburgh in 1887 by Lietze from Brazil, and since that date it has reappeared in British gardens. Mr. James O'Brien, of Harrow, kindly sent us materials for description.

On. hyphaematicum.

Pseudo-bulbs oblong, compressed, 3—4 inches long, monophyllous. Leaves about a foot long, ligulate-lanceolate, complicate at base. Scapes 4—5 feet long, much branched, pale purple below the branches, with a whitish sheathing bract at each joint. Flowers numerous, 1½ inches in diameter; sepals and petals oblong, acute, much undulated, red-brown tipped with yellow; lip with a broad claw and broadly reniform, apiculate blade, bright canary-yellow stained with red-purple beneath; crest with five keels, of which the outside two are the shortest. Column pale yellow, with a hatchet-shaped pale wing on each side of the stigma.

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* In this case the crest of the labellum has, without doubt, been developed at the expense of the front lobe, which is reduced to a very narrow blade. Its importance in the economy of the plant is, however, evident; for an insect visiting the flower would be more likely to alight on the prominent crest than on any other organ as the easiest, if not the only means of approach to the base of the labellum where honey would be secreted. In returning it could scarcely fail to touch the sensitive rostellum, and carry away the pollinia which the insect on alighting on another flower in the same way would certainly deposit on its stigma, and thence its fertilisation would be effected. An insect less than the common house-fly would be sufficient to accomplish this.

Oncidium hyphaematicum, Rchb. in Gard. Chron. 1869, p. 814. Regel's *Gartenfl.* 1871, t. 676.

A handsome species introduced in 1867 from Ecuador by Messrs. Backhouse, of York, but now quite rare if not lost to cultivation. The specific name is peculiar and refers to the colour of the flowers on the outside, from ὑφαιμάτικος, "covered with blood."

On. incurvum.

Pseudo-bulbs ovoid, 3—4 inches long, compressed with 3—5 elevated ribs on the flattened sides, di-triphyllous. Leaves linear-ligulate, acute, 12—15 inches long. Scapes 3—5 feet long, panicled, the branches distichous and alternate, gradually smaller upwards, each branch loosely racemose. Flowers an inch in diameter; sepals and petals linear-lanceolate, undulate, rose-pink tipped and spotted with white; lip three-lobed, the lateral lobes small, roundish oblong, pink and white, the front lobe clawed, spreading, sub-rotund, apiculate, the claw pink, the blade white; crest yellow, five-toothed, the middle tooth much the largest. Column wings narrow, white; anther not beaked.

Oncidium incurvum, Barker in Bot. Reg. 1840, misc. No. 174. *Id.* 1845, t. 64. Batem. *Orch. Mex. et Guat.* t. 29 (1843). *Bot. Mag.* t. 4824. *Illus. hort.* 1855, t. 49. Lindl. Fol. Orch. Oncid. No. 72.

sub-var.—*album*, flowers wholly white with the exception of the yellow crest of the labellum.

Originally introduced from Mexico by Mr. George Barker, of Birmingham, in whose collection at Springfield it flowered for the first time in this country in 1840. It was collected by Ross in the province of Oaxaca, and subsequently by Galeotti at Talea in the same province, at an elevation of 4,000—5,000 feet. The specific name was given by Mr. Barker in reference to the tendency of the petals to curve inwards when the flowers first open, the colour of which is unusual in the genus and comparable with that of *Oncidium ornithorhynchum*.

On. insculptum.

Pseudo-bulbs ovoid, compressed, smooth, 3—5 inches long, 1½—2 inches broad, diphyllous. Leaves ensiform, 12—18 inches long, complicate at base. Scapes 7—10 or more feet long, pale brownish green, flexuose paniculate along the distal half, the branches distant, short, and few flowered. Flowers 1½ inches in diameter, sepia-brown with a metallic lustre, the sepals and petals with a narrow straw-yellow margin, the crest also straw-yellow but sometimes white; sepals and petals clawed, the margin crisped and undulated; dorsal sepal orbicular, the lateral two oval-oblong; petals broadly oval; lip narrowly oblong with the lateral margins revolute and the apex reflexed; there are two curved auricles at the base below the crest, which is a thickened triquetral plate toothed in front. Column wings very narrow.

Oncidium insculptum, Rchb. in Gard. Chron. 1872, p. 1035.

A remarkable species introduced by Messrs. Backhouse from Ecuador, which flowered for the first time in this country in the collection of the late Mr. John Day, at Tottenham, in 1872. The labellum is very peculiar both in form and colour; the side lobes are small and reflexed so as not to be visible from the front; the middle lobe is covered with numerous warts, and its reflexed apex is of a greyish blue colour, a tint not to be seen in any other species of Oncidium yet introduced; the prominent crest somewhat resembles a Roman nose. We are indebted to the Royal Gardens at Kew for materials for description.

On. Jonesianum.

Pseudo-bulbs none. Leaves as in *Oncidium Cebolleta*, from which this species cannot be distinguished when not in flower. Peduncles 15–20 inches long, pale green mottled with purple, racemose, 10—15 flowered. Flowers 2—3 inches in diameter; sepals and petals obovate-oblong, undulate, yellowish white spotted with chestnut-brown; lip clawed with two yellow and red auricles at the base of the claw, the blade transversely oblong with a deep sinus in the anterior margin, undulate, white with some red spots in front of the crest which consists of a broad central ridge with lateral processes at each end much tubercled. Column wings oblong, white dotted with red.

Oncidium Jonesianum, Rchb. in Gard. Chron. XX. (1883), p. 781. *Bot. Mag.* t. 6982. Williams' *Orch. Alb. IV.* t. 183. *The Garden, XXXI.* (1887), t. 583. *Lindenia II.* t. 72. Godefroy's *Orchidophile*, 1886, p. 50. Regel's *Gartenfl.* 1888, t. 1272.

sub-vars.—*flavens* (*Orch. Alb. VIII.* t. 360), sepals and petals pale yellowish green spotted with yellow, lip wholly white; *phæanthum* (*Reichenbachia I.* t. 21), sepals and petals reddish brown, the front lobe of the lip wholly white.

By far the handsomest of the small group of Oncids (TERETIFOLIA) to which it belongs, and indeed one of the most attractive in the genus. It was introduced by Mr. Horsman, of Colchester, in 1883 through M. Saint Leger, a Brazilian plant collector of French origin, who discovered it in 1878 in northern Paraguay, about 60 miles south of the river Apa which separates that country from the Brazilian province of Parana, and afterwards imported from the same region by Messrs. Sander and Co. It was dedicated by the late Professor Reichenbach to the Rev. Morgan Jones, "an enthusiastic lover of orchids." Among the sub-varieties, of which there are many, *phœanthum* is a very distinct one which occurred among the plants acquired by Sir Trevor Lawrence, Bart. No Oncidium has been received in our time with greater applause than *Oncidium Jonesianum*, and with none has the attempted culture more signally failed.

On. Kramerianum.

Pseudo-bulbs orbicular, compressed, 1—1½ inches in diameter, rugose, monophyllous. Leaves elliptic-oblong, 6—9 or more inches long, 2—2½ inches broad, deep green mottled with blackish green above, spotted with dull purple beneath. Scapes slender, terete, 20—30 or more inches long, jointed at intervals of 1½—2 inches, the nodes swollen, the internodes sheathed to one-third of their length by pale brown, acute bracts. Flowers several, produced singly by successive elongations of the peduncle from the joint immediately below the ovary (as in *Oncidium Papilio*). Dorsal sepal and petals similar, erect,* linear-spathulate, 2—2½ inches long, undulate towards the apex, reddish brown; lateral sepals oval-oblong with serrulate, undulate margin, deflexed, orange-red mottled with golden yellow; lip sub-pandurate, the lateral lobes rotund, yellow spotted with red-brown, the front lobe transversely oblong with a sinus in the anterior margin, bright canary-yellow bordered with red; crest prominent with two basal and three front lobes, deep bronzy purple. Column with two horizontal plate-like wings beneath the stigma, and two cirri above terminating in a blackish gland.

Oncidium Kramerianum, Rchb. *Xen. Orch. I.* p. 80, t. 33 (1855). *Fl. Mag.* 1870, t. 465. Van Houtte's *Fl. des Serres XIX.* t. 1956. *Belg. hort.* 1874, p. 258. *Lindenia VI.* t. 246. De Puydt, *Les Orch.* t. 31. On. Papilio Kramerianum, Lindl. Fol. Orch. Oncid. No. 197 (1855). Jennings' *Orch.* t. 11. On. nodosum, Regel's *Gartenfl.* 1880, t. 1018 (papilioniforme).

This remarkable Oncidium was originally discovered by Warscewicz on the slopes of Chimborazo in Ecuador, at 3,000 feet elevation, about the year 1852, and was shortly afterwards introduced by him to the garden of Herr Jenisch at Flotbeck Park near Hamburg, where it flowered in 1854, and after whose gardener, Kramer, it is named. It continued to be very rare in European gardens until its discovery in other localities on the Andes of Ecuador and New Granada; in the last named country it has been found on all the three Cordilleras at 1,000—3,000 feet elevation growing on old trees more or less exposed to direct sunlight.

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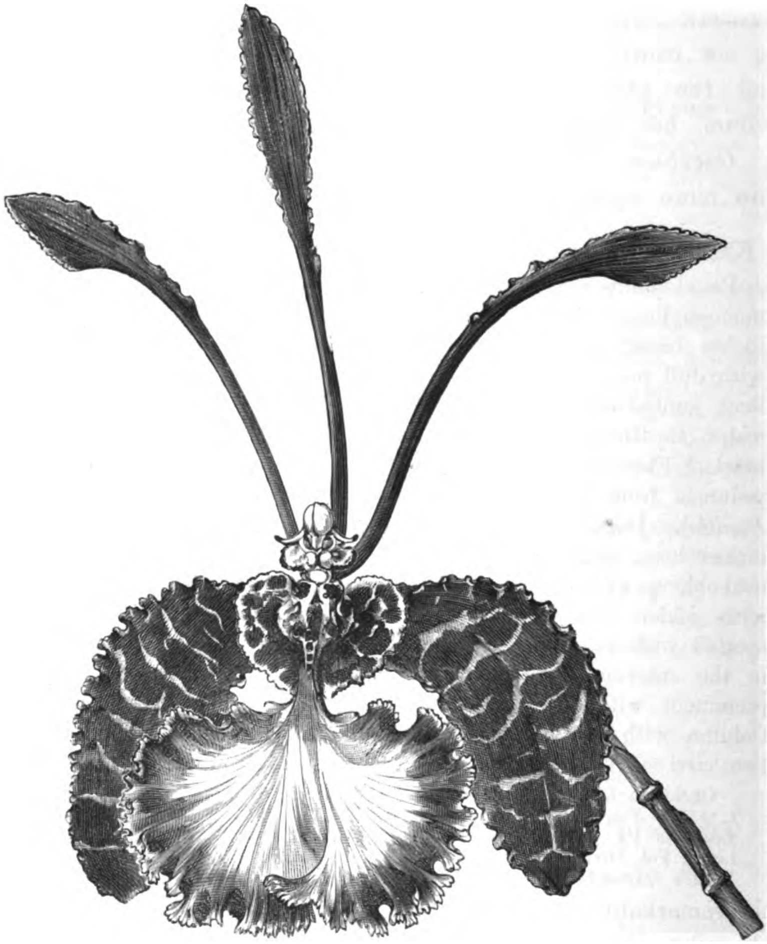
* When the flowers first expand, but after a few days the petals are often deflexed at a considerable angle from the dorsal sepal.



Oncidium Kramerianum.

The flowers of *Oncidium Kramerianum* much resemble those of the well-known "Butterfly Orchid" *On. Papilio,* the peculiar structure of which we have pointed out under that species, and from which *On. Kramerianum* may be chiefly distinguished by the following characters which, so far as our observations have extended, are tolerably constant. In *On. Kramerianum* the pseudo-bulbs are more orbicular and often smaller, the leaves shorter and less profusely spotted; the peduncles are shorter with the nodes at shorter intervals, not flattened and ancipitous above. The flowers are generally a little smaller with the upper sepal and petals shorter and differently coloured; the claw or isthmus of the front lobe of the lip is shorter and the blade is of a brighter colour than in *On. Papilio.*

On. lamelligerum.

Pseudo-bulbs elongate-ovate or flagon-shaped, 4--6 inches long, diphyllous. Leaves linear-ligulate, acuminate, 15—20 or more inches long. Scapes 5—7 or more feet long, flexuose, distantly branched, many flowered. Flowers 3 inches across vertically; sepals clawed, light brown, the upper one sub-orbicular with crisped yellow margin; the lateral two divergent, longer than the upper one, ovate-oblong, obtuse, keeled behind and more or less incurved; petals clawed, ovate-oblong, sub-acute, much crisped towards the apex, the basal half light brown with some narrow, tranverse, yellow streaks, the apical area light yellow; lip linear-oblong, acute, light yellow stained with pale purple, the basal lobes oblong, denticulate, concave, purple; crest white, consisting of an acute edged median plate with two lateral processes at each end and with a few small teeth between them. Column wings hatchet-shaped, purple.

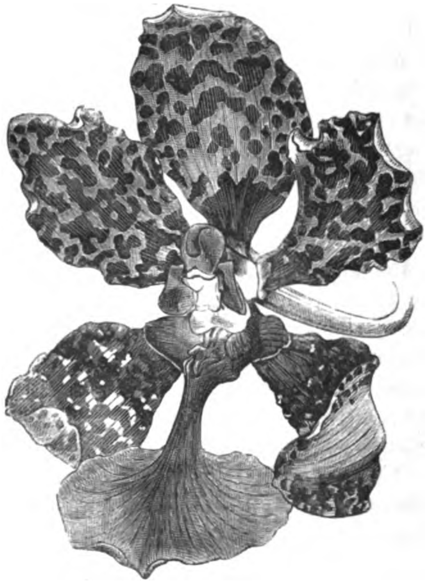
Oncidium lamelligerum, Rchb. in Gard. Chron. VI. (1876), p. 808. Id. X. (1878), p. 684. Williams' *Orch. Alb. VII.* t. 315. *Lindenia, VI.* t. 278.

Discovered by Edward Klaboch in Ecuador in 1875—6, and introduced to European gardens shortly afterwards. It flowered for the first time in this country in the autumn of 1878, in the collection of Mr. Charles Dorman, at The Firs, Sydenham; it has since flowered in several collections, the flowers in some instances showing slight deviations in colour from the first introduced type. For materials for description we are indebted to Mr. Charles Winn, of Selly Hill, Birmingham, and to Messrs. Charlesworth and Shuttleworth, of Bradford and Clapham.

On. Lanceanum.

Pseudo-bulbs none. Leaves from a stoutish rhizome, elliptic-oblong, 12—18 inches long and 3—5 inches broad, erect, coriaceous, deep dull green more or less spotted with purple. Scapes from the base of the latest formed leaves and longer than them, erect, panicled above. Flowers numerous, 2—2½ inches in diameter, very fragrant; sepals and petals similar, oval-oblong, obtuse, yellow or yellow-green much spotted with chocolate-brown; lip usually dark purple or rose-purple, less frequently with the front lobe white, three-lobed, the side lobes triangular-oblong, the intermediate lobe with a broad claw and transversely oblong blade; crest an elevated fleshy plate that is obscurely bi-lamellate behind. Column wings oblong, oblique, purple.

Oncidium Lanceanum, Lindl. in Trans. Hort. Soc. N.S. II. p. 100, t. 7 (1836). Id. in *Bot. Reg. XXII.* (1836), t. 1887. Id. Fol. Orch. Oncid. No. 133. Paxt. *Mag. Bot. IV.* p. 169. Knowles and Westc. *Bot. Cab.* t. 79. De Puydt, *Les Orch.* t. 32. Van Houtte's *Fl. des Serres, XVIII.* t. 1842—3. Gard. Chron. XXI. (1884), p. 609, with fig. Williams' *Orch. Alb. III.* t. 129 (Louvrexianum) *Lindenia, I.* t. 16 (superbum). *The Garden, XXIX.* (1886), t. 539. Sander's *Reichenbachia, II.* t. 73.



Oncidium Lanceanum.
(From the *Gardeners' Chronicle.*)

First introduced from Surinam (Dutch Guiana) in 1834 by Mr. John Henry Lance, who communicated to Dr. Lindley the following account of it, which has been frequently transcribed into the different periodicals where this Oncid is figured, but which is still the best extant:—

> "The first specimen of this splendid epiphyte I discovered was growing on the trunk of a large tamarind tree in a noble avenue of these trees close to the Government House in Surinam. I afterwards found a great number of plants in different parts of the colony; they were generally attached to the stems or branches of the Tamarind,* the Sapodilla,† or

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* The name of Tamarind is given in different tropical countries to various species of Leguminous trees belonging chiefly to the genera Acacia, Inga, Dialium and Pithecolobium.

† *Sapota Achras.*

> the Calabash trees,* appearing to prefer those to any other; however, on being tied to the branches of the Orange, the Soursop,† the Mammee,‡ and even the *Brugmansia arborea,* it grew well upon them all and produced vigorous stems with upwards of twenty blossoms on each stem. The scent is extremely fragrant and is retained after the flower is dried, only becoming fainter and more of a spicy odour than when fresh. The plant remains in full beauty ten or twelve days, a long period in that climate; and I found that it always required a shady situation and a living stem to grow upon, without which it would not produce its flowers in the highest perfection."§

It flowered for the first time in this country in Messrs. Loddiges' nursery shortly after its introduction, and not long afterwards in the Horticultural Society's garden at Chiswick, in the orchid collections at Chatsworth, Wentworth, and other places. *Oncidium Lanceanum* is not confined to Surinam; it was found by the brothers Schomburgk in many places in British Guiana, and we have seen an herbarium specimen from that colony gathered by Mr. Jenman, Curator of the Botanic Garden at Georgetown.

On. Leopoldianum.||

> "Vegetative organs not seen. Panicle very long, branching, many flowered. Bracts broadly ovate, acute, ⅛ inch long. Flowers about 1¾ inches in diameter; sepals shortly unguiculate, the dorsal one broadly elliptic, obtuse; the lateral two elliptic-ovate, obtuse; petals elliptic-ovate, sub-acute, a little shorter and narrower than the lateral sepals; lip fleshy, trulliform, slightly three-lobed, sub-acute, the basal lobes rounded; crest consisting of three short fleshy parallel plates, the central one being higher than the other. Column wings rounded and fleshy."
> —R. A. Rolfe in Gard. Chron. VIII. s. 3 (1890), p. 556.

Oncidium Leopoldianum, Rolfe in Gard. Chron. loc. cit. *Lindenia, VI.* t. 274.

"This is a very handsome Oncidium, recently introduced by Messrs. Linden, L'Horticulture Internationale of Brussels, from the Andes of South America, and dedicated to His Majesty Leopold II., King of the Belgians. Its nearest ally is *Oncidium corynephorum,* Lindl., a fine species discovered by Matthews in Peru, in 1838, and known only by dried specimens."

On. leucochilum.

Pseudo-bulbs oval-oblong, 3½—5 inches long, much compressed with 2—3 prominent ribs on the flattened sides, diphyllous. Leaves ligulate, acute, 8—12 inches long. Scapes 5—7 feet long, branched almost from the base, the branches slender, distant, gradually shortening upwards. Flowers numerous, 1½ inches in diameter; sepals and petals similar and sub-equal, elliptic-oblong, acute, greenish brown barred with light yellow-green; lip white, three-lobed, the side lobes small, oblong, obtuse, the intermediate lobe broadly clawed, transversely oblong, emarginate; crest a narrow raised plate with two minute teeth on each side, terminating in one long erect tooth and two smaller horizontal ones in front. Column wings hatchet-shaped, rose-pink, the face below the stigma bright yellow.

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* *Crescentia Cujete.* † *Anona muricata.* ‡ *Mammea americana.*

§ Trans. of Hort. Soc. loc. cit. supra. || Not seen by us.

Oncidium leucochilum, Batem. in Bot. Reg. sub. t. 1920 (1837). Id. *Orch. Mex. et Guat.* t. 1 (1840). Paxt. *Mag. Bot. VII.* p. 241. Lindl. Fol. Orch. Oncid. No. 167. Regel's *Gartenfl.* 1873, t. 763 (speciosum). Rchb. in Gard. Chron. 1873, p. 978 (Dawsonianum). Cyrtochilum leucochilum, Planchon in Van Houtte's *Fl. des Serres, V.* t. 522 (1849). *Belg. hort.* 1885, p. 287.

Originally discovered on the mountains of Guatemala in 1835 by Mr. G. Ure Skinner, who sent plants to Mr. Bateman at Knypersley, where it flowered for the first time in this country in the autumn of the following year. Three years afterwards it was detected by Hartweg, near Malacotan, in southern Mexico, and a little later it was imported from that country by Mr. H. Bunney, of the Kingsland Nursery and subsequently by other horticultural firms. On account of the remarkable combination of colours observable in its flowers, *Oncidium leucochilum* is justly regarded as one of the most attractive of the genus. Many variations in colour have appeared in different gardens, but none of them sufficiently distinct to require separate notice; in all of them the lip when first open is white, a character which suggested the specific name λευκὸς, "white," and χεῖλος, "a lip."

On. Lietzei.

Pseudo-bulbs sub-cylindric, compressed, 3—5 inches long, invested to half their length by whitish membraneous sheaths. Apical leaves two, oblong-lanceolate, acute, 6—8 inches long. Scapes slender, 30—36 inches long, dull purple mottled with white below, panicled above. Flowers numerous, not fully expanding, bright red-brown sometimes spotted with yellow; upper sepal obovate-oblong, concave, the lateral two connate into a narrow oblong blade bidentate at the apex; petals nearly equal and similar to the upper sepal, with undulate margin; lip broadly obovate-oblong with two basal linear reflexed auricles,, and a fleshy tuberculose crest on the disk in front of which are two erect teeth. Column wings oblong, obtuse, sub-falcate, white.

Oncidium Lietzei, Regel's *Gartenfl.* 1881, t. 1044. *Id.* 1887, t. 1279 (aureo-maculatum).

This species, if species it is, was first described by Dr. Regel in the *Gartenflora* for 1881 from plants sent to the Imperial Botanic Garden at St. Petersburg from Brazil by Lietze. A variety is figured in the *Gartenflora* of 1887 under the name of *aureo-maculatum* which differs from the type in the floral segments being spotted with yellow; a third variety named *bicolor* is also mentioned. Dr. Regel compares *Oncidium Lietzei* with *On. amictum*, Lindl., figured in the *Botanical Register* for 1847 which we have mentioned under *On. Gardneri*, but it is much nearer *On. pubes*, so near indeed that, when more ample materials for comparison are available, it may hereafter be reduced to a variety of that species. Our description was taken in the Spring of 1890 from a plant in the collection of Mr. F. G. Tautz at Hammersmith, since dispersed.

On. Limminghei.

Pseudo-bulbs roundish, compressed, ¾ inch in diameter, rugose, monophyllous. Leaves sessile, ovate, oblique, acute, 1—1½ inches long, dull green speckled with crimson. Peduncles filiform, 4—5 or more inches long, bearing 3—5 flowers that expand in succession, each flower 1½ inches in diameter; dorsal sepal and petals similar and equal, oval, obtuse, slightly undulated, tawny brown with a paler margin; the lateral sepals smaller than the dorsal one, with which they are united at their base, light yellow barred with red-brown; lip with two rounded basal auricles that are yellow spotted with red; the blade transversely oblong, emarginate, bright yellow with some red spots near the anterior margin; crest an elevated plate with two smaller parallel lamellæ behind. Column wings bipartite, pectinate, the superior part the smallest and incurved.

Oncidium Limminghei, Morren in *Belg. hort.* 1856, p. 353. Lindl. Fol. Orch. Oncid. No. 198. Van Houtte's *Fl. des Serres, XVIII.* t. 1827. Rchb. in Gard. Chron. 1868, p. 1114. *Lindenia, I.* t. 20.

A very interesting species that first became known to science and to horticulture through the late Professor Morren, of Liége. Plants were sent to Belgium from Caracas,* by the Dutch Consul, M. Van Lousberghe, one of which flowered in the Botanic Garden at Liége, in August, 1855, whence it was communicated to Dr. Lindley by Professor Morren in time for insertion in the Monograph of Oncidium in the *Folia Orchidacea*, published in October of that year. Since that time it has been sparingly imported, but it is believed to be as rare as it is curious. The species was dedicated to Comte Alfred Limminghe, at that time one of the most liberal patrons of Belgian horticulture. Our description is from a plant that flowered in the collection of Mr. Lee, at Downside, Leatherhead, since dispersed.

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* It is extremely doubtful whether this Oncid is a native of Caracas. The precise habitat is probably known only to the collectors who send it to Europe from that port.

Oncidium Limminghei belongs to the small section of the genus of which *On. Papilio* is the type. The flowers are produced by successive elongations of the rachis as in that species; the dorsal sepal and petals are similar and of a duller colour than the other segments, but not elongated as in *On. Papilio* and *On. Kramerianum*; they are also differently shaped from the lateral sepals, which are brightly coloured. Another peculiarity is seen in the leaves, which usually lie flat on the surface of the block to which the plant is affixed; the mid-nerve is not the geometric diameter of the leaf, but divides the blade into two unequal parts as in the Begonia and Lime.

On. longipes.

Pseudo-bulbs ovoid, elongate, ¾—1 inch long, in clusters of threes and fours from a slightly ascending rhizome as thick as an ordinary writing-pencil, mono- oftener diphyllous. Leaves linear-oblong, mucronate, 4—6 inches long. Scapes as long as the leaves, 3—5 or more flowered. Flowers 1—1½ inches in diameter; sepals and petals pale red-brown streaked transversely with yellow and with yellow tips, spathulate or narrowly oblong, undulate, the lateral sepals longer and narrower than the dorsal one; lip bright canary-yellow, three-lobed, the side lobes roundish oblong, the front lobe transversely oblong, emarginate; crest an oblong fleshy disk covered with numerous small whitish warts, and with two prominent teeth in front. Column wings very narrow, almost obsolete.

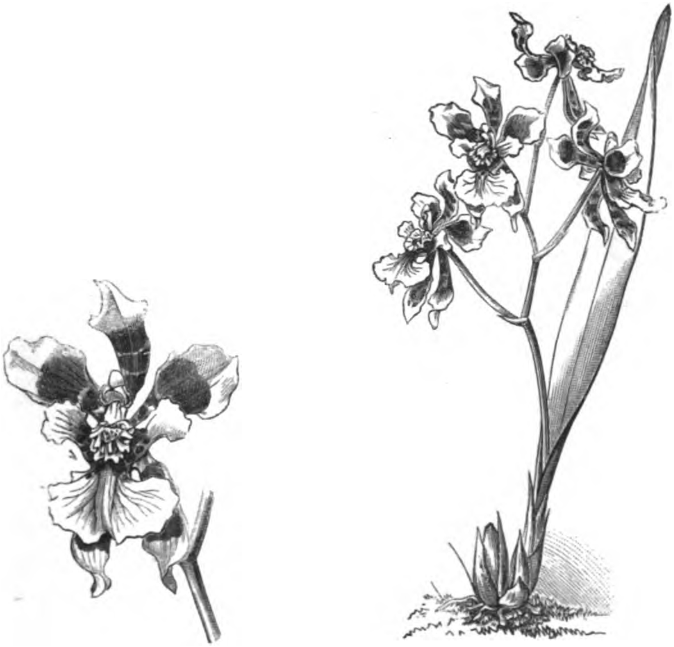
Oncidium longipes, Lindl. in Paxt. Fl. Gard. I. No. 76 (1851). Id. Fol. Orch. Oncid. No. 45. On. janeirense, Rchb. in Bonpland. Apr. 1854.

var.—Crœsus.

Flowers somewhat larger and differently coloured; sepals and petals dark brown-purple, lip golden yellow with a brown-purple band around the crest.

On. longipes Crœsus, supra. On. Crœsus, Rchb. Hamb. Gartenz. 1857, p. 314. *Fl. Mag.* N.S. t. 40. *The Garden, XXXV.* (1889), t. 706. On. longipes, *Bot. Mag.* t. 5193.

Although one of the most frequently seen, and one of the most tractable of Oncids under cultivation, scarcely anything has been divulged respecting its origin beyond the statement that it was originally introduced from Rio de Janeiro about the year 1850, and that it has since been gathered near Novo Friburgo, on the Organ Mountains. It has been generally cultivated since that date, its small size and free-flowering habit having secured for it the favour of many amateurs. As a horticultural plant the variety *Crœsus* is superior to the type, the strong contrast between the golden yellow of the labellum and the brown-purple of the other segments being very striking; it was introduced about the same time as the species, but it has always been very rare.



Oncidium longipes.

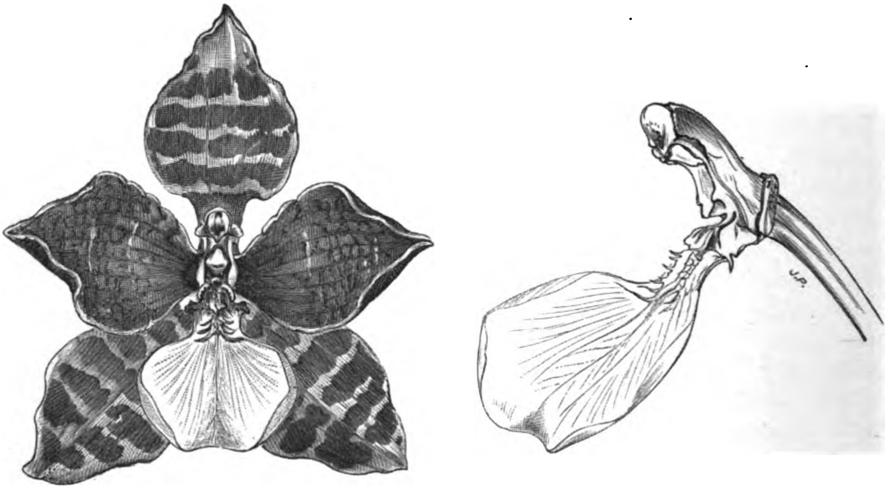
Very near *Oncidium longipes*, and probably only a variety of it is *On. uniflorum*, figured in the *Botanical Register* of 1843, t. 43, which, according to Dr. Lindley, differs from *On. longipes* in its one-flowered peduncles and "in the crest of the labellum consisting of an oblong cluster of numerous small smooth fingers, and in the wings of the column being conspicuously two-lobed." [*] The figure, however, shows no such striking difference except in the column wings. It was introduced from the Organ Mountains by Sir Charles Lemon, in whose collection at Carclew, in Cornwall, it flowered in November, 1842. We find no record of its being in cultivation since that date.

[*] Fol. Orch. Oncid. No. 44.

On. loxense.

Pseudo-bulbs ovoid, 4—5 inches long, monophyllous. Leaves narrowly lanceolate, 9—15 inches long and 1½—2 inches broad. Scapes straggling, 3½—5 feet long. Flowers distant, 3 inches in diameter; sepals shortly clawed, the lateral two free, oval-oblong, obtuse, undulate with a prominent keel behind, cinnamon-brown barred with light yellow; petals similar but broader and less prominently keeled behind, bright olive-brown with a few scattered yellow, transverse markings; lip coriaceous, transversely and broadly oblong, obscurely apiculate and with two minute auricles near the base of the rather broad claw, bright orange-yellow, paler on the disk; crest a fleshy protuberance with four shallow plates behind and a raised median fringed plate in front, on each side of which are numerous bristles springing from the protuberance.

Oncidium loxense, Lindl. in Paxton's Fl. Gard. II. p. 126 (1852). Id. Fol. Orch. Oncid. No. 21. Rchb. in Gard. Chron. XXII. (1884), pp. 584 and 616. Williams' *Orch. Alb. X.* t. 439.



Oncidium loxense.

One of the finest of Oncidiums, and at the same time one whose botanical history is of the briefest description.

It was originally discovered in 1842 near Loxa, in Ecuador, by Hartweg, who found but a single plant with a panicle nine feet long. Many years afterwards Messrs. Backhouse, of York, obtained a coloured sketch prepared by their correspondent Dr. Krause;* and lastly in 1883 it was rediscovered by Edward Klaboch, who sent plants to Messrs. Sander and Co., of St. Albans, and these were probably the first to reach Europe alive. It is believed to be a very rare species in its native home, where, so far as at present known, it is confined to a district of limited extent.

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* *Fide* Reichenbach in Gard. Chron. XXII. (1884), p. 584.

Our description was taken from a plant that flowered in our houses in the Spring of 1891, and which is now in the superb collection of Baron Schroeder at The Dell.

On. luridum.

Pseudo-bulbs none. Leaves from a stout rhizome, oval-oblong, variable in size, 12—18 or more inches long, very leathery and generally with some small brown spots on both sides. Scapes 3—6 feet long, dull red-brown, loosely paniculate, the branches distant, short, 3—5 flowered. Flowers 1½ inches in diameter, very variable in colour, usually yellow- or red-brown with some yellow markings and spots; sepals and petals clawed, much undulated at the margin; upper sepal broadly oval or sub-orbicular, concave on the inner side; lateral sepals free, spathulate oblong; petals oblong, obtuse; lip three-lobed, the side lobes small, rounded with revolute margin; the front lobe shortly and broadly clawed, transversely oblong, emarginate; crest five-lobed, the front lobe an erect rounded plate, yellow spotted with red, on each side of this is a smaller, rounded rose-coloured tubercle, the two posterior lobes white, much tuberculated. Column wings reniform, pink or white.

Oncidium luridum, Lindl. in *Bot. Reg.* t. 727 (1823). Id. Gen. et Sp. Orch. p. 201 (1833). Id. Fol. Orch. Oncid. No. 131. *Bot. Mag.* t. 3603 (1837). On. cuneatum, Lindl. Collect. Bot. sub. t. 27. On. olivaceum, Lindl. Gen. et Sp. Orch. p. 202. Epidendrum guttatum, Lin. Sp. Pl. p. 1351. Cymbidium guttatum, Wild. Sp. Pl. IV. p. 102.

var.—intermedium.

Peduncles shorter, more rigid and with flexuose branches. Flowers larger with all the segments bright yellow, with numerous circular red-brown spots.

On. luridum intermedium, Lindl. Fol. Orch. Oncid. No. 131. On. intermedium, Knowles and Westc. *Fl. Cab. II.* p. 53, t. 60. Williams' *Orch. Alb. VIII.* t. 345.

sub-vars.—*atratum* (Journ. Hort. Soc. VI. (1851), p. 54, with fig), sepals and petals olive and rose, lip brown; *guttatum* (*Bot. Reg.* 1839, t. 19), sepals and petals chestnut-brown spotted and margined with yellow, lip paler, column whitish; *M. Morren's* (Fol. Orch. Oncid. No. 131 E), sepals and petals pale rose spotted with crimson and tipped with yellow, lip cinnamon-brown; *Mr. Dodgson's* (Williams' Manual, p. 490), flowers orange-yellow barred with dark brown; *purpuratum* (Gard. Chron. 1848, p. 149, with fig.), sepals and petals speckled with purple, lip crimson as in *Oncidium Lanceanum.**

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* Probably a natural hybrid between *Oncidium luridum* and *On. Lanceanum.* It does not appear to have been seen since its introduction by Messrs. Loddiges in 1847.

Oncidium luridum was one of the few Oncids known to Linnæus, which, as in the case of all other epiphytal orchids which he knew, he included in Epidendrum under the name of *Epidendrum guttatum*, his type being a Jamaica plant which Lindley believed to agree with the sub-variety *guttatum* described above. "The name *luridum* ought therefore in strictness to be abolished; but that of *guttatum* applies so generally to the whole genus that there would be more inconvenience than advantage in the measure."† The species is widely dispersed over the West Indian Islands, the adjacent parts of Central and South America, and also southern Mexico. Within this extensive region it was gathered by many of the earlier botanical collectors, among whom may be mentioned Dr. Bradford (Trinidad), Dr. Schomburgk (British Guiana), Hartweg (Mexico), White (Cuba), McFadyen (Jamaica), whose specimens are still preserved in British herbaria. It was first cultivated by Mr. Griffin, of South Lambeth, in 1823, whose plant, of which the origin is not stated, was figured in the *Botanical Register* and described and named by Dr. Lindley, who failed to identify it as the *Epidendrum guttatum* of Linnæus. Twelve years later *On. luridum* was brought by Cross from Trinidad to the Botanic Garden at Glasgow, and from that time to the present it has probably been rarely absent from British collections.

The variety *intermedium* is the handsomest of all the *luridum* forms we have seen; it was first sent from Cuba, in 1837, by a Spanish merchant of Havana to Mr. George Barker, of Birmingham, but was subsequently lost; it has recently reappeared in cultivation and is now in the collection of Baron Schroeder, at The Dell. Of the sub-varieties, *guttatum*, which is properly the type, is distinct; it was first imported by Messrs. Rollisson, of Tooting, in 1838, and is at present in cultivation in the Royal Botanic Garden at Glasnevin.

On. macranthum.

Pseudo-bulbs variable in size and shape, usually oval-oblong or ovoid-conic, more or less compressed, 4—6 inches long and 2—2½ inches broad, diphyllous. Leaves narrowly lanceolate, acute, 15—18 inches long.

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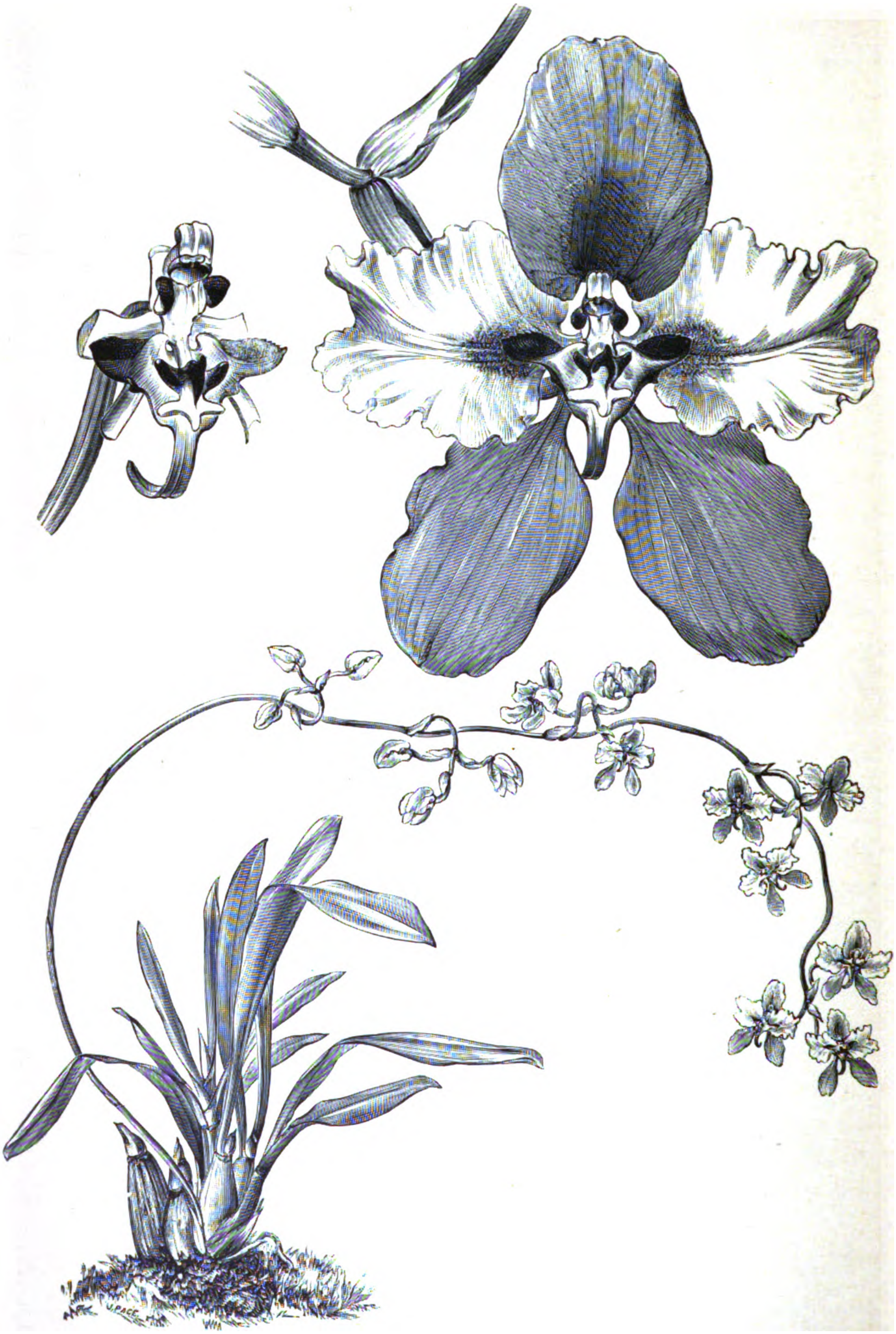
† Bot. Reg. 1839, sub. t. 16. *Luridum*, however, is the oldest name under the right genus, and such a name is accepted by many botanists, as it prevents complications and inconveniences that would arise if an older specific name under a genus to which the plant is no longer referred were insisted on.



Oncidium macranthum.

Scapes flexuose, scandent, 7—10 or more feet long, panicled, the branches short, distant and few flowered. Bracts boat-shaped, ¾ inch long. Flowers the largest in the genus, sometimes 4 inches in diameter; sepals clawed, orbicular-oblong, undulate, yellow toned with light brown; petals similar to the sepals but with a shorter claw and more undulate; lip much smaller than the other segments, hastate, the two lateral lobes horn-like, violet-purple at the base; the intermediate lobe tongue-shaped, attenuated to a reflexed tip, white bordered with violet-purple; crest cylindric with three larger violet-purple teeth in front and three smaller white ones behind. Column wings hatchet-shaped, brownish purple.

Oncidium macranthum, Lindl. Gen. et Sp. Orch. p. 205 (1832). Id. Fol. Orch. Oncid. No. 1. Id. in Paxt. Fl. Gard. II. p. 126. *Bot. Mag.* t. 5743. *Fl. Mag.* 1868, t. 386. Warner's *Sel. Orch. II.* t. 17. Jennings' *Orch.* t. 42 (1875). Gard. Chron. 1869, p. 739, with fig. Rchb. in Gard. Chron. XIV. (1880), p. 8 (Williamsianum). *The Garden, XXIV.* (1883), pl. 416. Sander's *Reichenbachia, II.* t. 64. *Lindenia, IV.* t. 152.

The earliest evidence of the existence of this superb Oncidium was a single flower in the herbarium of the Spanish botanists Ruiz and Pavon, which was acquired by Mr. A. B. Lambert, the author of *The Genus Pinus,* and now in the Natural History Museum at South Kensington. This flower was probably gathered about the year 1780, the locality given being Guayaquil, in Ecuador, but as this town is a port on the estuary of the River Palenque and situated near the arid coast, the specimen must have been obtained from the neighbouring Cordillera. A long interval elapsed before it again came under the cognisance of science, the first to rediscover the species being Matthews, who gathered it in 1838 at Tunguragua, on the Eastern Cordillera of Ecuador, at 10,000 feet elevation. It was next gathered by Hartweg near Alausi, by Professor Jamieson of Quito, near Calicali, and by Spruce at Llala and also in Matthews' locality, but none of these botanical collectors sent living plants to Europe. The first notice of it as a horticultural plant occurs in the horticultural journals of 1868, in the spring of which year it flowered for the first time in this country in the collection of Lord Londesborough at Norbiton, and shortly afterwards at Farnham Castle, and in our Chelsea nursery. No indication is given of the origin of these plants, which were doubtless all imported at the same time.

Oncidium macranthum is now well known as a magnificent species of easy culture, one plant of which when in flower "is enough to ornament a house of considerable dimensions."

On. maculatum.

Pseudo-bulbs ovoid, 3—4 inches long, much compressed, with 2—3 ribs on each of the flattened sides, diphyllous. Leaves linear-ligulate, 7—10 inches long. Scapes 12—18 inches long, racemose along the distal half, rarely paniculate. Flowers 2 inches in diameter; sepals and petals sub-equal, lanceolate-oblong, acute with reflexed tip, yellow, sometimes yellow-green heavily blotched with dark chestnut-brown; lip oblong-ovate, apiculate, obscurely three-lobed, the side lobes reduced to small triangular auricles, the basal half white, the apical half yellowish; crest consisting of four plates, of which the two middle ones are the largest, white streaked with red. Column wings narrow, horn-like below.

Oncidium maculatum, Lindl. Sert. Orch. sub. t. 48 (1838). Id. Fol. Orch. Oncid. No. 113 (1855). Knowles and Westc. *Fl. Cab. II.* t. 57. Cyrtochilum maculatum, Lindl. in *Bot. Reg.* 1838, t. 44. Id. *Sert. Orch.* t. 25. *Bot. Mag.* t. 3836 (ecornutum). *Id.* t. 8880.

A species very common in some parts of the Mexican province of Vera Cruz. It was first sent to the Horticultural Society of London by Hartweg in 1837; and two years later it was sent to the Woburn collection by Mr. Parkinson, Her Majesty's Consul in Mexico. For some years after its introduction, *Oncidium maculatum* was one of the most popular of the genus, but it is now rarely seen in amateur collections; at that time it was generally known as *Cyrtochilum maculatum.** It is one of the most variable of Oncids as regards the colour of its flowers.

On. Marshallianum.

Pseudo-bulbs ovate-oblong, 4—6 inches long, compressed, diphyllous. Leaves oblong-lanceolate, acute, 7—12 or more inches long, complicate at base. Panicles 3—5 or more feet long, much branched. Flowers variable in size and colour, the finest forms 2½—3 inches across vertically; dorsal sepal obovate-oblong, concave, dull yellow barred with pale red-brown; lateral sepals nearly concealed by the lip, oblong, connate to about one-third of their length, and coloured like the dorsal one;

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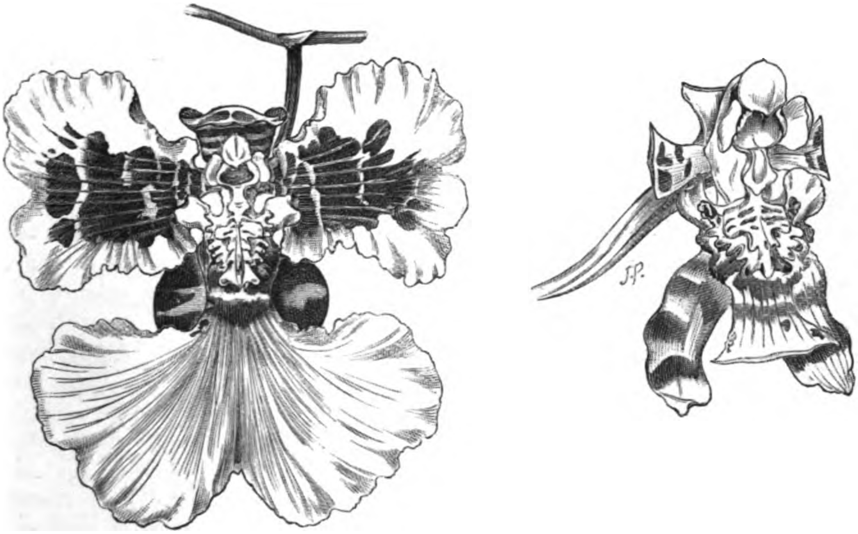
* Although Cyrtochilum has long since disappeared from the list of genera, it frequently occurs in the orchid literature of the period above referred to. It was founded by Humboldt and Kunth in the early part of the century on *Cyrtochilum undulatum* (*Oncidium undulatum* of Lindley), a very different plant from that figured under this name in Williams' *Orchid Album, VIII.* t. 368. It is chiefly distinguished from Oncidium by the labellum being much smaller than the other segments, its front lobe narrow, entire and bent back under the crest, the character that suggested the generic name, κυρτὸς, "bent," and χεῖλος, "a lip"; it thence corresponds to Bentham's section MICROCHILA. The group of species to which this form of the lip is peculiar, combined with other characters both floral and vegetative, constitute as fairly a natural genus as Miltonia or Odontoglossum; but the Cyrtochilum of Humboldt and Kunth as thus circumscribed was afterwards thrown into confusion by the addition of such species as *Oncidium maculatum*, *On. concolor*, *Miltonia flavescens*, *Odontoglossum bictonense* and others which do not conform to its essential character, and which subsequently led to its rejection.

petals broadly obovate-oblong, emarginate, undulate, bright canary-yellow spotted with red-brown in the centre; lip clawed, the claw auriculate, the blade large, spreading, two-lobed, broadly oblong, bright yellow, the claw and crest spotted with orange-red; crest consisting of a median triangular erect plate with two large teeth on the basal side, two smaller ones in front, and two minute ones on each side. Column wings short, quadrate, whitish.

Oncidium Marshallianum, Rchb. in Gard. Chron. 1866, p. 682. *Bot. Mag.* t. 5725. *Fl. Mag.* N.S. t. 285. Regel's *Gartenfl.* 1879, t. 979. Williams' *Orch. Alb. V.* t. 240. *Lindenia V.* t. 202.



Oncidium Marshallianum.

Introduced by Messrs. Low and Co. in 1865, through their collector, Blunt, along with *Oncidium crispum,* from which it may be distinguished when not in flower by its bright green pseudo-bulbs; its habitat may therefore be assumed to be on the Organ Mountains, near Novo Friburgo, in the Brazilian province of Rio de Janeiro, whence it has since been frequently imported. It is nearly allied to *On. pectorale,* introduced many years previously, but now rarely seen, from which it differs chiefly in the form of its sepals and lip, and especially in the crest of the last-named organ. Like most of the members of the sub-section to which it belongs (*Tetrapetala-macropetala,* of Lindley), and of which it is one of the handsomest, it is found to vary in the size and colour of its flowers, which usually expand in May and June.

It is dedicated to Mr. William Marshall, of Auchinraith, Bexley, well known as a former exhibitor of orchids. Our illustration represents a fine form in the collection of Sir Trevor Lawrence, Bart., at Burford Lodge.

A remarkable Oncidium, figured in Godefroy's *Orchidophile* for 1888, page 47, under the name of *On. Mantinii*, may here be noticed. It flowered in M. Truffaut's horticultural establishment at Versailles in the previous year, and had been acquired from M. Binot, an orchid collector at Petropolis in Brazil, with plants of *On. crispum*. It has the aspect of being a natural hybrid, of which *On. Marshallianum* is presumably one parent. Another supposed natural hybrid is figured in Williams' *Orchid Album*, *IX*. t. 405, under the name of *On. Larkinianum*; in this case the characteristics of *On. Marshallianum* evidently greatly preponderate.*

On. Martianum.

Pseudo-bulbs ovoid, 1½—2½ inches long, much compressed with three—four ribs on each of the flattened sides, monophyllous. Leaves oblong, acute, 5—7 inches long. Scapes panicled, as long again as the leaves, many flowered. Flowers 1½ inches in diameter; sepals and petals small, yellow barred with chestnut-brown; the dorsal sepal clawed, sub-orbicular, concave; the lateral two connate at the base, linear-oblong; petals oval-oblong, apiculate, undulate at the margin; lip large in proportion to the size of the flower, bright canary-yellow with some red-brown spots around the crest, three-lobed, the side lobes roundish oblong, the front lobe shortly clawed, transversely oblong with a shallow sinus in the anterior margin; crest a triangular erect plate with two smaller ones on each side. Column wings triangular, dentate at the outer margin.

Oncidium Martianum, Lind. in Bot. Reg. 1837, sub. t. 1920. Id. Fol. Orch. Oncid. No. 74. On. bicolor, Lindl. in *Bot. Reg.* 1843, t. 66.

First discovered by the German botanist and explorer, Dr. Martius, of Munich, in the Brazilian province of Minas Geraes, and imported from Brazil by Messrs. Loddiges about the year 1842. We are indebted to Mr. F. W. Moore, of Glasnevin, for materials for description.

On. microchilum.

Pseudo-bulbs ovoid or sub-orbicular, much compressed, 1½—2 inches long, monophyllous. Leaves rigid and leathery, oblong or elliptic-oblong, keeled behind, 7—12 inches long, 2½—3 inches broad, sub-acute, complicate at base, slightly glaucous. Scapes robust, issuing from a carinate inflated sheath, very glaucous, 3—4 feet long, branched along the distal half, the branches short, few flowered. Flowers 1¼ inches in diameter; sepals elliptic-oblong, keeled behind, the dorsal one broader than the lateral two, and concave, pale brown with some yellow markings; petals narrower than the sepals, oblong, obtuse, undulate, incurved, chestnut-brown (sometimes brown-purple) barred and margined with yellow; lip three-lobed, the intermediate lobe reduced to a small white protuberance, with a purple spot; the side lobes rotund, convex, white with some purple spots at their base; crest somewhat kidney-shaped, tuberculose, white with yellow and brown spots in front, reddish brown behind. Column wings triangular, white; anther beaked.

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* Doubtless other natural hybrids exist among Oncids, including some described in these pages as species, but the marks of hybridity in any such cases do not appear to be sufficiently evident to admit of their being classed as mules.

Oncidium microchilum, Batem. in Bot. Reg. 1840, misc. 193. Lindl. in *Bot. Reg.* 1845, t. 23. Id. Fol. Orch. Oncid. No. 21. Saunder's Ref. Bot. II. t. 122.

Discovered in Guatemala in 1838, and sent to Mr. Bateman by Mr. G. Ure Skinner, who afterwards communicated to Dr. Lindley the following particulars respecting its habitat:—

> "I first found *Oncidium microchilum* on the top of the Cuesta of Puentezuelas, in 1838. It was growing on a bare rock with a quantity of dead leaves and grass about its bulbs, and its roots woven into the interstices of the rock; it was very much exposed to the sun, except during the middle of the day, when a ledge of rock seemed to afford it a little shade. I afterwards found it in great abundance on the rocky banks of the river Michatayal. I never saw it except in such situations, generally exposed and always among rocks. The temperature generally of the above habitats is about 20° C. (68°—70° F.), and from being exposed, cold at nights."

It was subsequently found by Hartweg in the same country. Although Mr. Bateman received the first living plants sent to England, it flowered for the first time in the collection of Mr. Harter, of Broughton, near Manchester, in 1841. *Oncidium microchilum* is the only species of the section Microchila (Cyrtochilum) known to us whose habitat is north of the isthmus of Panama; it is remarkable for the almost obsolete intermediate lobe of the labellum, and for the variety of colours present in the flowers, which are, however, variable in this respect.

On. Micropogon.

Pseudo-bulbs broadly ovoid, 2—2½ inches long, compressed with acute edges, and with 2—3 ribs on each of the flattened sides, mono-diphyllous. Leaves linear-oblong, rounded at the apex, 4—6 inches long.

Scapes 12—18 inches long, pendulous, racemose, 7—10 or more flowered. Flowers variable in size in different plants, the largest 1½ inches across vertically; sepals linear-oblong, acuminate, yellow barred with red-brown, the lateral two connate at their base; petals clawed, sub-orbicular, bright canary-yellow; lip with three sub-equal bright yellow lobes, the lateral two orbicular, the intermediate one broadly obcordate; crest "tumid, covered with conical yellow and brown tubercles, margins expanded and pectinately toothed." Column wings deltoid.

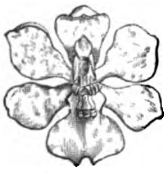
Oncidium Micropogon, Rchb. in Bonpl. 1854, p. 90. Id. Xen. Orch. I. p. 179, t. 63, fig. 2. Lindl. Fol. Orch. Oncid. No. 40. Regel's *Gartenfl.* 1855, t. 136. *Bot. Mag.* t. 6971. On. dentatum, Klotzsch ex Rchb. Xen. Orch. loc. cit.

Oncidium Micropogon was first cultivated in Consul Schiller's garden at Ovelgönne, near Hamburgh, in 1853, and two years later it is mentioned by Reichenbach in his *Xenia Orchidacea* as being in several gardens on the Continent. The plants were supposed to have been imported from Santa Catherina in southern Brazil, and they appear to have died out within a few years as nothing more was seen of the species till it was re-introduced by Messrs. Sander and Co. in 1886. It is very near *On. barbatum,* from which it is distinguished by its much larger flowers with differently shaped sepals, petals and crest. The specific name has nearly the same meaning as *barbatum,* "bearded," from μικρός, "small," and πώγων, "a beard."

On. nanum.

Pseudo-bulbs none. Leaves from a creeping rhizome, oval-oblong, 3—6 inches long, dull pea-green spotted with red. Scapes decumbent, panicled, the branches short and few flowered. Flowers ¾ inch in diameter; sepals and petals similar, obovate-oblong, obtuse, incurved, yellow spotted with red-brown; lip bright yellow, transversely oblong with two small auricles at the base; crest large for the size of the flower, two-lobed, the front lobe at right angles to the back one. Column wings linear, deflexed, and "tipped with a lucid gland."

Oncidium nanum, Lindl. in Bot. Reg. 1842, misc. No. 30. Id. Fol. Orch. Oncid. No. 107. Schomb. Reis. in Brit. Guiana, III. p. 913.



Oncidium nanum, enlarged.

A curious little plant deserving of notice on account of its richly coloured flowers. It was first discovered by Schomburgk growing on the trunks of trees on the banks of the Pomeroon River in British Guiana, and sent by him to Messrs. Loddiges in 1842. According to Dr. Lindley, it was also detected by Spruce near the junction of the Rio Negro with the Amazon.

On. nigratum.

Pseudo-bulbs ovoid-oblong, 4—5 inches long, compressed, ribbed and furrowed on the flattened sides, diphyllous. Leaves broadly lanceolate, about a foot long. Scapes flexuose, 10—15 feet long, loosely branched, the branches bearing from five to fifteen flowers. Flowers an inch in diameter; sepals and petals linear-oblong, undulate, reflexed, white with 2—3 black-purple blotches on each; lip shorter than the other segments, pale yellow with a red-brown bar in front of the crest, three-lobed, the side lobes rotund with revolute margin, the intermediate lobe oblong, apiculate; crest many toothed, the teeth arranged in four longitudinal rows. Column wings narrow, pale yellow.

Oncidium nigratum, Lindl. in Paxt. Fl. Gard. I. No. 122 (1851). Id. Fol. Orch. Oncid. No. 105. Rchb. in Gard. Chron. XIX. (1883), p. 790.

Discovered by Schomburgk during his exploration of British Guiana, 1840—44, and sent by him to Messrs. Loddiges, in whose nursery it did not flower till some years afterwards, but was subsequently lost. It was re-introduced by us in 1881 through our collector David Burke, who found it on the southern slopes of the Roraima Mountain at 5,000—6,000 feet elevation. Although the flowers are small they are produced in great profusion on the long rambling panicle, and are among the most distinct in the genus; they have some resemblance on superficial view to the pretty *Odontoglossum blandum.*

On. obryzatum.

Pseudo-bulbs oval-oblong, much compressed, 2—3 inches long, ribbed and channelled on the flattened sides, monophyllous. Leaves linear-oblong, sub-acute, 6—9 inches long. Scapes scandent, 4—6 feet long, paniculate, the branches short and few flowered. Flowers about an inch across vertically; sepals and petals narrowly spathulate, obtuse, yellow barred with red-brown on the basal half. Lip auriculate at the base, the blade broadly clawed, transversely oblong, deeply two-lobed, of a paler yellow than the other segments; crest a triangular median raised plate with two teeth in front, one on each side and a cluster of smaller ones behind. Column wings toothed, prolonged and nearly meeting above the anther.

Oncidium obryzatum, Rchb. in Bonpl. 1854, p. 198. Id. in Gard. Chron. XII. (1879), p. 456 (dasystalix). Regel's *Gartenfl.* 1878, t. 925. Lindl. Fol. Orch. Oncid. No. 95.

Very little has been divulged respecting the origin of this Oncid. It is vaguely stated to be a native of Peru, and that it was first discovered by Warscewicz about the year 1852. It is not now often seen in the orchid collections of this country, but we have quite recently received a fine panicle from Mr. F. W. Moore, of the Royal

Botanic Garden, Glasnevin. The specific name, literally "refined gold"—ὄβρυζον χρυσίον—refers to the colour of the flowers.

On. ornithorhynchum.

Pseudo-bulbs oval-oblong, compressed, 1—2 inches long, diphyllous. Leaves linear-lanceolate, 7—10 inches long. Scapes pendulous or arching, longer than the leaves, panicled, many flowered. Flowers about ¾ inch across vertically, rose-lilac; sepals and petals oblong, the lateral sepals free and divaricate, the petals broader and undulated; lip sub-panduriform, the lateral lobes with reflexed margins and sometimes of a darker colour than the rest of the flower, the anterior lobe emarginate; crest consisting of five yellow, toothed lamellæ, in front of which are two horn-like teeth. Column wings triangular toothletted; anther beaked.

Oncidium ornithorhynchum, Hbdt. et Kunth, Nov. Gen. Plant. I. p. 345, t. 80 (1815). Lindl. Gen. et Sp. Orch. p. 204 (1832). Id. in *Bot. Reg.* 1840, t. 10. Id. Fol. Orch. Oncid. No. 189. Batem. *Orch. Mex. et Guat.* t. 4. *Bot. Mag.* t. 3912. Knowles and Westc. *Fl. Cab. III.* t. 136.

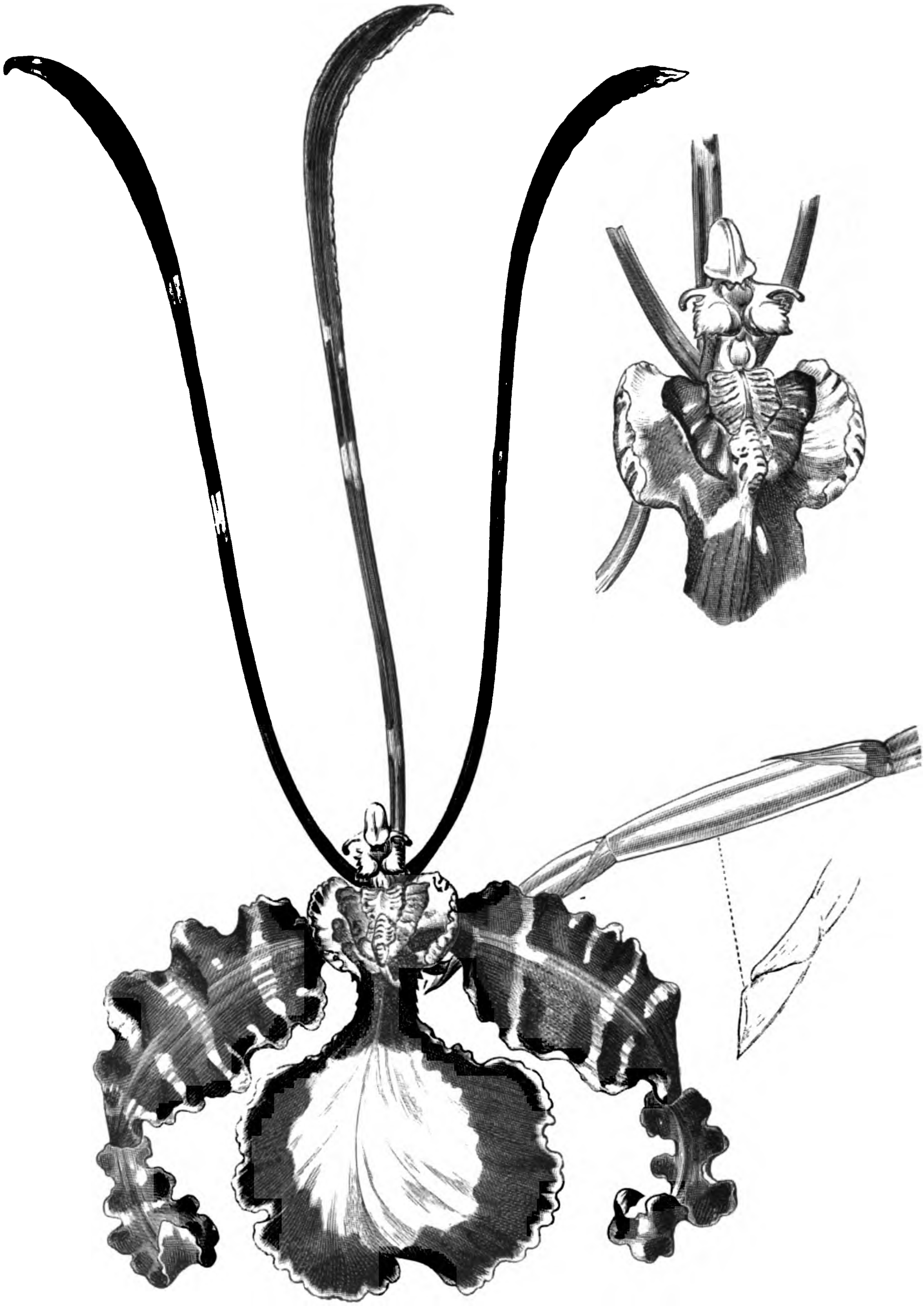
sub-var.—*albiflorum* (Gard. Chron. 1873, p. 503. *Fl. Mag.* N.S. t. 398), flowers dull white, the crest of the lip yellow as in the type.

Oncidium ornithorhynchum is a native of southern Mexico and Guatemala, occurring in several localities but always at a considerable elevation. It was originally discovered by Humboldt in the beginning of the present century on the mountains near Valladolid, in the Mexican province of Michoacan. It was not introduced into British gardens till 1836, when it was received simultaneously by Mr. Bateman from Guatemala through Mr. G. Ure Skinner, and by Messrs. Loddiges from Oaxaca probably through Karwinsky. The white-flowered form first appeared in the collection of the late Mr. John Day, at Tottenham, in 1873

The specific name, from ῥύγχος, "a beak," and ὀρνίθος, "of a bird," refers to the beaked anther, whence this Oncid is sometimes popularly known as the Bird's Bill Oncidium, but this character is common to all the species included in Lindley's sub-section *Rostrata* as well as to many others.

On. panchrysum.

Pseudo-bulbs broadly ovate, much compressed, 2½ inches long, monophyllous. Leaves ligulate, sub-acute, 9—12 inches long. Scapes stoutish, erect, as long again as the leaves, panicled and many flowered. Flowers of a uniform bright canary-yellow, 1¼ inches across vertically; sepals ovate-oblong, acute, the lateral two free and divergent; petals similar but broader and obtuse at the apex; lip sub-panduriform, the basal



Oncidium Papilio.

lobes rotund, the front lobe transversely oblong, emarginate; crest five-lobed. Column wings obsolete.

Oncidium panchrysum, Lindl. in Journ. Hort. Soc. IV. p. 267 (1849). Id. Fol. Orch. Oncid. No. 180 (1855). On. anomalum, Rchb. in Linnæa XXII. p. 845 (1849).

Originally discovered by Linden in New Granada in 1842, and subsequently gathered by Funck and Schlim on the eastern Cordillera, between Pamplona and Ocaña, at 7,000—8,000 feet elevation. It is a handsome species with pure yellow flowers, a character expressed by the name from πάν, "all," and χρύσεος, "golden"; it may be recognised by the delicate glaucescence that covers the green portion of the scape.

On. Papilio.

Pseudo-bulbs oval-oblong or sub-orbicular, 1½—2 inches long, much compressed, wrinkled, monophyllous. Leaves elliptic-oblong, 6—9 inches long, 2—2½ inches broad, coriaceous, dull green much mottled and blotched with purplish crimson which is most developed on the under side. Scapes 2—4 feet long, jointed, with a sheathing acute bract at each joint, terete from the base to beyond the middle, the upper portion flattened and ancipitous. Flowers several, produced singly by successive elongations of the peduncle from the joint immediately below the ovary, variable in size; dorsal sepal and petals 3½—4½ inches long, linear, slightly dilated towards the apex, dull reddish crimson, yellowish green at the back; lateral sepals oblong, sub-acuminate, decurved and undulate, bright chestnut-red with some narrow transverse yellow markings; lip three-lobed, the side lobes small, rounded, yellow spotted with red; anterior lobe broadly clawed, sub-orbicular with a shallow sinus in the front margin, canary-yellow with a broad bright red marginal band; crest a thickened obscurely three-lobed elevated plate, with two small protuberances on the basal side, white spotted with red. Column wings lacerated, much dilated below, and with two cirri above having a blackish gland at their tip.

Oncidium Papilio, Lindl. in *Bot. Reg.* sub. t. 910 (1825). Id. Gen. et Sp. Orch. p. 203 (1832). Id. Fol. Orch. Oncid. No. 197. *Bot. Mag.* t. 2795 (1828). *Id.* t. 3733 (1840). Knowles et Westc. *Fl. Cab. I.* t. 12. Paxt. *Mag. Bot. V.* p. 175. Van Houtte's *Fl. des Serres, IX.* t. 920. *Illus. hort.* s. 3, t. 500 (Eckhardtii). Jennings' *Orch.* t. 11 (pictum). Williams' *Orch. Alb. VI.* t. 279 (majus).

Oncidium Papilio is one of the most remarkable orchids ever introduced into European gardens, not only on account of the singular appearance of its flowers but also for their scarcely less curious structure, a peculiarity, however, which they share with the allied species *On. Kramerianum* and *On. Limminghei* already described. The flowers are not produced in racemes or panicles like those of most other Oncids, but in the same manner as those of the Saccolabiate

Masdevallias (*Masdevallia Chimæra*, etc.); that is to say—after the first flower has expanded and which is apparently terminal, a second flower is produced from the joint immediately below the ovary, and which usually (not always) expands after the first flower has faded; in like manner a third flower is produced from the node below the ovary of the second, then a fourth in the same way; in fact an indefinite succession of flowers may be produced in this manner till the plant is exhausted or till some check is applied. The most obvious structural peculiarities are—the excessive elongation and parallelism (when first open) of the dorsal sepal and petals, and their dull coloration, while the lateral sepals are dilated and as brightly coloured as the labellum. The curious glandular appendages of the column wings are also deserving of notice.

Oncidium Papilio was introduced from Trinidad, in 1824, by Sir Ralph Woodford, the Governor, who sent living plants to several collections, one of which flowered for the first time in this country in the nursery of Mr. Colville, at Chelsea, in the spring of the following year; but the earliest efforts to cultivate it in glass-houses in Great Britain do not appear to have been very successful, judging from the distorted flowers that were first figured. Of the sub-varieties, of which there are many, none require especial notice except that known in gardens as *majus* or *giganteum;* this is the finest of all the Papilio forms, the dorsal sepal and petals sometimes attaining a length of 5—7 inches.

The bizarre appearance of the flowers suggested the specific name of Papilio or the Butterfly.

On. pectorale.

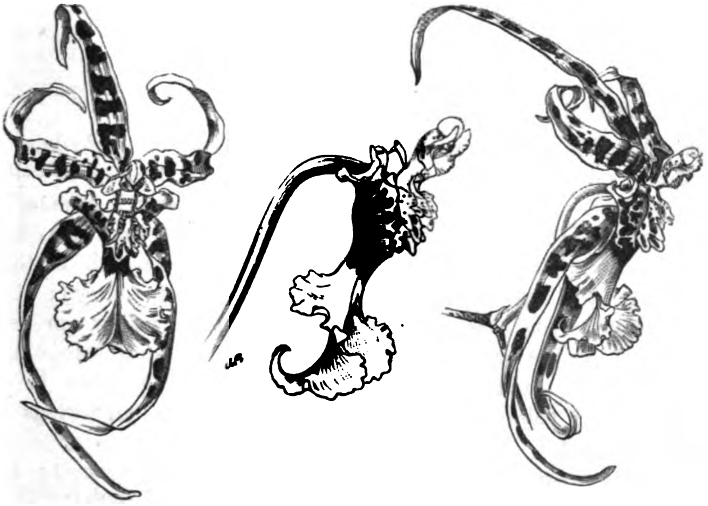
Pseudo-bulbs ovoid, compressed, 1½—2 inches long, diphyllous. Leaves linear-lanceolate, 6—8 inches long. Scapes longer than the leaves, racemose, but sometimes paniculate, many flowered. Flowers 1½—2 inches in diameter; sepals oval-oblong, chestnut-brown barred and margined with yellow, the lateral two connate to about one-half of their length; petals similar but larger, chestnut-brown with a narrow yellow border and a few yellow spots; lip auriculate at the base, the blade clawed, sub-orbicular, undulate with a cleft in the anterior margin, bright yellow; crest convex, tuberculose, the tubercles blackish crimson. Column wings rounded, brown spotted with yellow.

Oncidium pectorale, Lindl. *Sert. Orch.* t. 39 (1838). Id. Fol. Orch. Oncid, No. 62.
On. Pollettianum, Rchb. in Gard. Chron. XXVI. (1886), p. 326.

First cultivated by Mr. Buller, of Downs, near Exeter, in 1838, who had received it from Rio de Janeiro, whence it was subsequently imported by Messrs. Loddiges. It seems to have been lost to cultivation for many years till it reappeared in the collection of Mr. H. M. Pollett, at Fernside, Bickley, in 1886. This plant differing in some trivial characters from Lindley's type, was made a new species by Reichenbach with the proviso that it might be a natural hybrid between *Oncidium dasytyle* and *On. Gardneri;* but on comparing Mr. Pollett's specimen with the type preserved in the herbarium at Kew its identity with Lindley's *On. pectorale* was satisfactorily established.

On. phymatochilum.

Pseudo-bulbs ovoid-oblong, compressed, 3—4 inches long, monophyllous. Leaves narrowly elliptic-oblong, 9—12 or more inches long. Scapes slender, pale green spotted with dull crimson, 3—5 feet long, loosely paniculate. Flowers 2 inches in diameter, crumpled; sepals and petals reflexed, linear, acuminate, pale yellow banded and spotted with brown, but sometimes ivory-white spotted with orange-red, the petals broader and the free lateral sepals longer than the dorsal sepal; lip white spotted with red around the crest, three-lobed, the lateral lobes auriculate, oblong, obtuse, the intermediate lobe trowel-shaped, with a reflexed



Oncidium phymatochilum.

acuminate tip; crest triangular in outline, many toothed, the three front teeth much the largest. Column wings laciniated, white spotted with red.

Oncidium phymatochilum, Lindl. in Gard. Chron. 1848, p. 139, with fig. Id. in Paxt. Fl. Gard. I. sub. t. 18, p. 78 (1850—51), Id. Fol. Orch. Oncid. No. 191. *Bot. Mag.* t. 5214. Linden's *Pesc.* t. 35. Van Houtte's *Fl. des Serres, XXIII.* t. 2465.

A very elegant species, first cultivated by the Rev. John Clowes, of Broughton Hall, near Manchester, and by Messrs. Loddiges, of Hackney, about the year 1840, neither of whom left any record of its origin, which remained unknown to science till its habitat was revealed by M. Pinel, a French merchant trading in Brazil, who collected it in the neighbourhood of Novo Friburgo and sent plants to various correspondents in France and Belgium, including M. Van Volxem of Brussels, one of whose plants was figured in Linden's *Pescatorea,* published in 1860.

Oncidium phymatochilum is a remarkably distinct species both as regards its flowers and its vegetative organs, and one not likely to be confused with any other; it has been inaptly compared with *Odontoglossum nævium.* The specific name refers to the crest of the labellum, from φύμα, "a tumour," and χεῖλος, "a lip."

On. prætextum.

Pseudo-bulbs ovoid, 1½—2 inches long, compressed, diphyllous. Leaves ensiform, sub-acute, 5—7 or more inches long. Scapes 30—40 inches long, paniculate, arching. Flowers fragrant, 1½ inches in diameter; sepals pale chestnut-brown barred with yellow, the dorsal one clawed, obovate-oblong, obtuse, the lateral two narrower, oblong, connate at their base; petals as broad again as the dorsal sepal, wholly brown; lip with a broad claw, at the base of which are two square yellow auricles; blade fan-shaped, yellow with a broad brown margin; crest consisting of two lamina that are confluent behind, and two projecting lobes in front, all warted, light yellow spotted with brown. Column wings rounded, yellow and red.

Oncidium prætextum, Rchb. in Gard. Chron. 1873, p. 1206. Id. XV. (1881), p. 720. Id. in Regel's *Gartenfl.* (1887), p. 1. t. 1238. *Bot. Mag.* t. 6662.

First discovered by the Danish botanist, Dr. Warming, in Lagoa Santa,* and afterwards in the province of São Paulo, in southern Brazil, by Mr. E. D. Jones who sent it to Mr. J. H. Wilson, of Liverpool, in 1873; it was shortly afterwards imported by ourselves from Rio de Janeiro.

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* Not found on any map to which we have access.

Oncidium prætextum has been occasionally confused with *On. curtum*, to which it is nearly allied, but from which it may be distinguished by its different crest, by its narrower lateral sepals which are connate at the base only, and sometimes by its smaller flowers which are usually of a duller colour. The specific name refers to the brown marginal band of the lip, and was suggested by a similar ornament on the Roman *toga*.

On. pubes.

Pseudo-bulbs sub-cylindric, tapering, 2—2½ inches long, diphyllous. Leaves narrowly oblong-lanceolate, 3—5 inches long. Scapes 15—24 inches long, panicled, the branches distichous and alternate, gradually shorter upwards; bracts small, subulate. Flowers about an inch in diameter, variable in colour, red-brown barred and spotted with yellow; dorsal sepal and petals clawed, obovate, obtuse, incurved; lateral sepals connate into an oblong blade, bifid at the apex; lip three-lobed, the side lobes linear, reflexed, the intermediate lobe broadly obovate, emarginate, red-brown bordered with yellow; crest tuberculose, pubescent, toothed in front. Column wings oblong, sub-falcate, obtuse.

Oncidium pubes, Lindl. in *Bot. Reg.* t. 1007 (1826). Id. Gen. et Sp. Orch. p. 199 (1832). Id. Fol. Orch. Oncid. No. 70 (1855). *Bot. Mag.* t. 3926 (flavescens). On. bicornutum, *Bot. Mag.* t. 3109 (1831).

A species of somewhat singular aspect, originally discovered by Descourtilz in the forests near Bananal, in the Brazilian province of Minas Geraes.* It was introduced by the Horticultural Society of London, in 1824, through David Douglas, who brought it from Rio de Janeiro. Seven years later it was sent to Mrs. Arnold Harrison, of Aigburth, near Liverpool, by Mr. William Harrison, who had gathered it in woods 60 miles inland from Rio; it was afterwards found by Gardner and by Miers on the Organ Mountains; it is doubtless dispersed over a considerable area in southern Brazil. The specific name refers to the soft villous hairs around the margin of the stigma.

On. pulchellum.

Pseudo-bulbs none. Leaves radical, usually in pairs or in fours, equitant, linear-lanceolate, 3—5 or more inches long, acutely keeled behind. Scapes slender, erect, 12—15 inches high, racemose or loosely paniculate, 12—20 or more flowered. Flowers an inch across vertically, white with a flush of rose on all the segments; dorsal sepal ovate, cuneate, concave, the lateral two connate into an oblong, spathulate blade, bidentate at the apex and concealed by the lip; petals like the dorsal sepal; lip sub-quadrate, four-lobed, the lobes rounded and nearly equal; crest three-lobed, in front of which is an ochreous spot. Column wings ovate-oblong, rose-pink.

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* Ex Lindl. Fol. Orch. Oncid. No. 70.

Oncidium pulchellum, Hook. in *Bot. Mag.* t. 2773 (1827). Lindl. Gen. et Sp. Orch. p. 206 (1832). Id. in *Bot. Reg.* t. 1787 (1836). Id. in Paxt. Fl. Gard. I. sub. t. 33. Id. Fol. Orch. Oncid. No. 31.

First discovered by Mr. C. S. Parkes in Demerara growing on trees, who sent it to the Liverpool Botanic Garden, where it flowered for the first time in this country in June, 1827. Many years afterwards it was detected by Schomburgk on the southern slopes of the Roraima, growing on sandstone rocks and flowering in November. It is also a native of Jamaica, where it has been gathered by several botanists. Although one of the prettiest of the small Oncids it is not often seen in cultivation.

Oncidium pulchellum is one of a small group of species dispersed over the West Indies and neighbouring parts of Central and South America, distinguished by the absence of pseudo-bulbs and by their rigid equitant leaves, that is to say—the front surfaces of the leaf on each side of the mid-nerve are brought into contact and grow together except at their edges, the leaf then often resembles a reaping-hook with a groove along the back.*

On. pulvinatum.

Pseudo-bulbs orbicular-oblong, compressed, 1½—2 inches in diameter, monophyllous. Leaves rigid, erect, oblong, acute, 9—12 inches long and 2—3½ inches broad. Scapes slender, flexuose, 5—7 or more feet long, loosely paniculate. Flowers very numerous, an inch in diameter; sepals and petals similar and sub-equal, clawed, oval-oblong, the upper sepal concave and bent forwards, the basal half red-brown, the apical half yellow; lip three-lobed, light yellow spotted with red, the side lobes rotund with fimbriate margin, the intermediate lobe transversely oblong, emarginate; crest a circular papillose cushion, whitish spotted with red. Column wings rounded.

Oncidium pulvinatum, Lindl. in *Bot. Reg.* 1838, misc. No. 115. Id. 1839, t. 42. Id. in Paxt. Fl. Gard. II. icon. xyl. No. 126. Id. Fol. Orch. Oncid. No. 118.

First cultivated by Mr. Richard Harrison, of Aigburth, Liverpool, who received it from his brother William at Rio de Janeiro in 1838, and he probably obtained it at Novo Friburgo, its known habitat. It closely resembles *Oncidium divaricatum* in habit and aspect, but is distinguished from that species by its differently shaped labellum, the crest of which is entire (not lobed).* Like *On. divaricatum* it is one of the most tractable of Oncids under cultivation.

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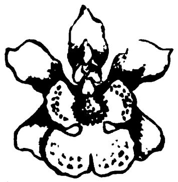
* The section EQUITANTIA of Lindley and Bentham.

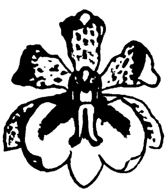

Oncidium pulvinatum (slightly diminished).

On. pumilum.

Pseudo-bulbs none. Leaves from a creeping rhizome, oblong, acute, 2—4 inches long, rigid, erect. Scapes as long as or longer than the leaves, paniculate, the branches short, and the flowers small and crowded. Sepals and petals minute, oblong-spathulate, obtuse, yellow spotted with red-brown; lip three-lobed, yellow, the side lobes the largest, roundish oblong, the intermediate lobe sub-quadrate, truncate; crest bipartite, the two parts divergent, each consisting of two parallel ridges. Column wings oblong, acute, decurved.

Oncidium pumilum, Lindl. in *Bot. Reg.* t. 920 (1825). Id. Gen. et Sp. Orch. p. 205. Id. Fol. Orch. Oncid. No. 106. Id. in Paxt. Fl. Gard. II. icon. xyl. No. 132. *Bot. Mag.* t. 3581.

A curious little plant first cultivated by Dean Herbert at Spofforth, Yorkshire, in 1825, whither it had been sent from Rio de Janeiro by one of his correspondents who had found it growing on the trunk of *Bombax Ceiba* near Botofogo. It has since been gathered in several localities in the neighbourhood of Rio, where it forms large tufts on the trunks of Crescentia and other trees. We are indebted to Mr. O. O. Wrigley, of Bridge Hall, Bury, Lancashire, for materials for description. This species should not be confused with *Oncidium nanum,* which has larger flowers with a different labellum and crest.


Oncidium pumilum (enlarged).

On. pyramidale.

Pseudo-bulbs ovoid, 1—2 inches long, compressed, diphyllous. Leaves linear-ligulate, 5—8 inches long, dark dull green. Peduncles erect or nodding, 12—15 or more inches long, panicled, many flowered. Flowers an inch in diameter, bright canary-yellow with some red spots and markings on all the segments; sepals and petals reflexed, the sepals linear-oblong, keeled behind, the lateral two free; the petals broader, oval-oblong; lip sub-panduriform, the basal lobes roundish-oblong, the front lobe obcordate, emarginate; crest whitish, consisting of about ten small teeth. Column with two narrow ascending wings that meet above the anther; anther beaked.

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* See page 81.

Oncidium pyramidale, Lindl. in Ann. Nat. Hist. XV. p. 384. Id. Fol. Orch. Oncid. No. 98.

A species rarely seen in British gardens, and of whose origin scarcely anything appears to be known beyond the simple fact that it was first discovered by Hartweg in woods near Pasto in southern Colombia in 1842. We are indebted to Mr. O. O. Wrigley for materials for description.

On. raniferum.

Pseudo-bulbs clustered, oblong, 1—2 inches long, tapering upwards, compressed, furrowed, diphyllous. Leaves linear, grass-like, 5—8 inches long. Scapes as long as the leaves, sparingly branched, many flowered. Flowers small but showy, bright yellow, the crest of the lip orange-red; sepals and petals reflexed, oblong; lip three-lobed, the side lobes linear-oblong, spreading, the front lobe broadly obovate with the anterior margin obscurely crenulate; crest large for the size of the flower, consisting of an oblong obscurely bipartite cushion curiously tubercled. Column wings very narrow.

Oncidium raniferum, Lindl. in Bot. Reg. sub. t. 1920 (1837). *Id.* 1838, t. 48. Id. Fol. Orch. Oncid. No. 194. *Bot. Mag.* t. 3712.

First introduced from Brazil in 1837 by Mr. Knight, our predecessor at the Royal Exotic Nursery, and shortly afterwards found by Gardner on the Organ Mountains, whence it has since been occasionally imported with other orchids. It was aptly characterised by Sir W. J. Hooker as "a sprightly little orchidaceous plant." The specific name, a fanciful one, meaning "frog-bearing," was suggested by the curious form of the crest which somewhat resembles the figure of a frog *couchant*. We are indebted to Mr. F. W. Moore, of Glasnevin, for materials for description.

On. reflexum.

Pseudo-bulbs ovoid, 1¼ inches long, compressed, mono-diphyllous. Leaves linear-lanceolate, acute, 6—8 inches long. Peduncles slender, straggling, 24—30 inches long, pale green mottled with dull crimson, sparsely branched along the distal half. Flowers 1½ inches across vertically; sepals and petals similar and sub-equal, linear-oblong, acute, undulated and reflexed, light yellow-green barred with dull red-brown, the lateral sepals free and divaricate; lip large and spreading, three-lobed, bright gamboge-yellow with some red spots on and around the crest; the basal lobes roundish oblong with revolute margins; the front lobe broadly clawed, transversely oblong with a sinus in the anterior margin; crest with about ten tubercles of nearly equal size. Column wings hatchet-shaped, denticulate; anther beaked.

Oncidium reflexum, Lindl. in Bot. Reg. sub. t. 1920 (1837). Id. Fol. Orch. Oncid. No. 158. Rchb. Xen. Orch. I. p. 93, t. 36, fig. 1. On. pelicanum, Lindl. in Bot. Reg. 1840, misc. No. 216. *Id.* 1847, t. 70. On. cruentum, Hort. Low.

A native of southern Mexico, first detected by Count Karwinsky about the year 1832, and introduced shortly afterwards through him by Messrs. Loddiges. Some years later it was received by Mr. Bateman from the Botanic Garden at Munich, under the name of *Oncidium pelicanum*, and is figured as such in the *Botanical Register* for 1847. It was afterwards imported by Messrs. Low and Co., and distributed by them under the name of *On. cruentum.** *On. reflexum* is a bright coloured species frequently met with in orchid collections.

On. Retemeyerianum. †

"Pseudo-bulbs nearly obsolete. Leaves cuneate, oblong-acute, more or less keeled on the inferior side, very thick with a purplish hue. Peduncles stout with a few distant acute sheaths, purplish dotted with green, racemed, many flowered; bracts acutely triangular, one-third to one-half as long as the stalked ovary. Flowers fleshy, about 2 inches in diameter; sepals and petals oblong, apiculate, pale yellow with light chocolate-brown spots, the petals a little broader than the sepals; lip constricto-pandurate, deep purplish violet, yellow around the crest which consists of two pairs of blunt tubercles and an 'interjected' central one. Column wings rounded, bent downwards, yellow."—Saunders' *Refugium Botanicum.*

Oncidium Retemeyerianum, Rchb. in Bot. Zeit. 1856, p. 513. Id. Xen. Orch. III. p. 43, t. 218. Saunders' Ref. bot. II. t. 74 (1869). *Belg. hort.* 1872, t. 14, p. 152. Rolfe in Gard. Chron. VI. s. 3 (1889), p. 294.

Described as a very curious species, distinct in the colour and substance of its flowers, that first appeared in the garden of Herr Retemeyer at Bremen, in 1856, and in the following year in the nursery of M. Chantin at Paris. Ten years later it was sent to the late Mr. Wilson Saunders from Mexico, and thence its native country became known; it has subsequently been sent from that country to several horticultural establishments, both in England and on the Continent. It belongs to the *Sarcoptera* group of Oncids, and has therefore for its allies the better known *Oncidium Lanceanum* and *On. Cavendishianum*, but anomalous in some of its characters.

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* *Vide* the late Mr. John Day in Scrap Book No. 10. It is highly probable that *Oncidium funereum* of the Mexican botanists La Llave and Lexarza is the same species as *On. reflexum* described above, but their description is too vague to render the identity certain.

† Not seen by us.

On. sarcodes.

Pseudo-bulbs variable in size, sub-fusiform, compressed, 4—6 inches long, di- rarely tri-phyllous. Leaves oblong, acute, complicate at base, 6—10 inches long. Scapes slender, dull purple freckled with pale green, 3—5 feet long, branched along the distal half, the branches short, few flowered. Flowers 1½—2 inches in diameter; sepals and petals chestnut-brown bordered with yellow, the dorsal sepal obcordate, concave, the lateral two smaller, obovate-oblong, keeled behind; petals obovate, obtuse with undulate margin; lip bright yellow with a few red-brown spots around the crest, three-lobed, the side lobes small, oblong with reflexed margin, the front lobe transversely oblong with undulate margin; crest an oblong plate lobed in front, and with a tooth on each side near the middle, light yellow dotted with brown. Column wings sub-triangular.

Oncidium sarcodes, Lindl. in Journ. Hort. Soc. IV. p. 266 (1849). Id. Fol. Orch. Oncid. No. 84 (1855). Van Houtte's Fl. des Serres, VI. p. 237, with fig. Warner's *Sel. Orch. I.* t. 23. *Illus. hort.* s. 3, t. 165 (1874). *Lindenia, V.* t. 234. On. Rigbyanum, Paxt. *Mag. Bot. XVI.* p. 257 (1850).

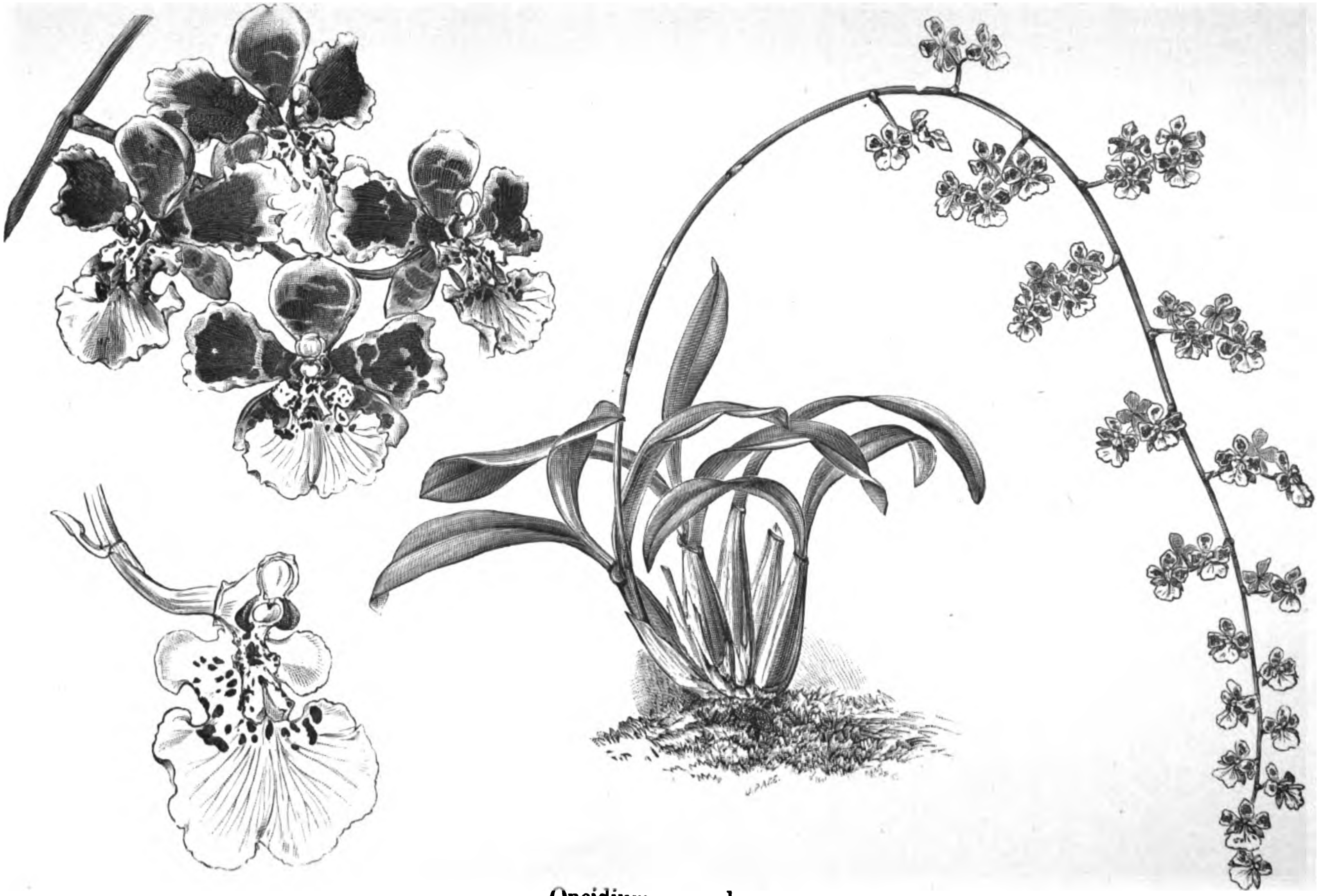
Although one of the most admired of Oncids, and one that is generally cultivated, the records of the botanical and horticultural history of *Oncidium sarcodes* are of the slenderest description. It was first received by the Horticultural Society of London in April, 1849, from Mr. P. N. Don, and from that time to the present its precise habitat does not appear to have been divulged. The importations are received from Rio de Janeiro, and the plants are said to be collected in the neighbourhood of Novo Friburgo, on the Organ Mountains.

The specific name *sarcodes* (σαρκώδης), "flesh-like," refers to the peculiar red-brown of the flowers.

On. Schlimii.

Pseudo-bulbs ovoid, much compressed with acute edges, and with 2—3 ribs on each of the flattened sides, diphyllous. Leaves narrowly lanceolate, 8—12 inches long. Scapes slender, flexuose, 4—5 feet long, loosely paniculate. Flowers exceeding an inch in diameter, very numerous; sepals and petals yellow, with 2—3 red-brown blotches; the dorsal sepal and petals similar and equal, spreading, clawed, oblong, obtuse; the lateral sepals narrower, linear-oblong; lip with two basal auricles and a two-lobed reniform blade that is broadly clawed, yellow with a red-brown band around the crest, which consists of 9—10 teeth, of which the central one is the most prominent. Column with two small rounded wings below the stigma, and a spreading toothletted one on each side of it that is produced upwards into a horn-like cirrus; anther beaked.

Oncidium Schlimii, Lindl. in Paxt. Fl. Gard. II. p. 168 (1852). Id. Fol. Orch. Oncid. No. 128.



Oncidium sarcodes.

A native of the eastern Cordillera of New Granada near Ocaña, where it was detected by Linden in 1842 at 3,000—4,000 feet elevation,[*] and where some years later it was gathered by Schlim, by whom probably it was introduced into European gardens; it was first cultivated in this country by Mr. Brocklehurst, of The Fence, near Macclesfield. The flowers of this Oncid are brightly coloured and produced in great profusion; the curious column wings and beaked anther well distinguish the species. We are indebted to the Royal Gardens at Kew for materials for description.

On. serratum.

Pseudo-bulbs ovoid, compressed, 4—5 inches long, diphyllous. Leaves narrowly lanceolate, 9—15 or more inches long. Scapes flexuose, 5—7 or more feet long, distantly branched, many flowered. Flowers 3 inches across vertically, on pedicels 2 inches long, sheathed at their base by an ovate-lanceolate pale bract about ½ inch long; sepals clawed, the dorsal one sub-orbicular, crisped at the margin, chestnut-brown with a narrow yellow border; the lateral two ovate-oblong, deflexed and then curving upwards and sideways like a saddle; petals like the lateral sepals but shorter, more crisped, and indented at the apex, chestnut-brown to two-thirds of their length, the apical third bright yellow; lip much smaller than the other segments, linear-spathulate, reflexed with two small hatchet-shaped basal lobes, purplish brown; crest a central white projecting plate with two acute teeth in front and a notched plate on each side. Column wings dagger-shaped, ascending, red-brown.

Oncidium serratum, Lindl. Sert. Orch. sub. t. 48 (1838). Id. Paxt. Fl. Gard. II. p. 126, with fig. Id. Fol. Orch. Oncid. No. 6. Gard. Chron. 1850, p. 279, with fig. *Bot. Mag.* t. 5632.

This singular Oncid was first made known to science by Matthews, who sent a rude copy of an old Spanish drawing from Peru (Ecuador?) to Sir W. J. Hooker, at Kew, about the year 1838. It was first cultivated in Europe by M. Pescatore, of La Celle, St. Cloud near Paris, who sent the flower to Dr. Lindley in 1850, from which the woodcut in Paxton's *Flower Garden* was taken. It has since been occasionally imported from the Andes of Ecuador. The flowers are of remarkable form and very difficult to describe; when first open the petals cling together by the interlocking of their crispation, so that they cannot be easily separated.

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[*] It is stated in the *Gardeners' Chronicle*, VI. s. 3 (1889), p. 42, that *Oncidium Schlimii* has been imported by Messrs Charlesworth and Shuttleworth in a batch of *Odontoglossum cirrosum*, that is to say, 800—1,000 miles distant from the Ocaña locality.

Oncidium serratum is the type species of a group of Oncids belonging to the section MICROCHILA, characterised chiefly by the elongated lateral sepals, the dorsal one being almost orbicular, the curiously crisped petals which often cling together when first open, and by the dagger-shaped column wings. The group includes *On. trifurcatum*, Lindl.,* *On. trilingue*, Lindl.,† *On. tetracopis*, Rchb.,‡ *On. plagianthum*, Rchb.,‖ *On. cryptocopis*, Rchb., *On. ludens*, Rchb.,§ *On. lamelligerum*, Rchb., *On. monachicum*,** Rchb., *On. chrysodipterum*, nobis, and probably others, whose specific characters have not been sufficiently defined to admit of their being technically distinguished the one from the other. Till authentic materials can be brought together for a more critical examination and comparison, it is perhaps safest to leave them as they are, although they all bear so strong a likeness to each other as to form a race of Oncids that might be included under one species, the different forms representing the different links in a chain of affinities too close to be rent asunder by separate specific names. Moreover, the habitats of all occur within a limited area on the Ecuadorean Andes, and most, if not all of them have been imported with *On. serratum*.

On. sessile.

Pseudo-bulbs ovate-oblong, 3—4 inches long, much compressed, with about three rounded ribs on each of the flattened sides, diphyllous. Leaves ensiform, acute, 8—15 inches long, the whole plant of a pea-green colour. Scapes 12—24 inches long, branched along the distal half, the branches somewhat distant, alternate, spreading. Flowers numerous, 1½ inches in diameter, canary-yellow with the basal half of the sepals and petals dotted with red-brown; sepals and petals oblong, obtuse, undulate, the dorsal sepal a little the broadest, the lateral two spreading nearly parallel with the petals; lip three-lobed, the side lobes roundish oblong, the front lobe larger, transversely oblong, deeply emarginate; crest sub-conic, oblate, tuberculose, white dotted with red. Column wings narrow, denticulate.

Oncidium sessile, Lindl. in Paxt. *Fl. Gard. I.* t. 21 (1851). Id. Fol. Orch. Oncid. No. 174 (1855). Williams' *Orch. Alb. V.* t. 228.

A native of Caracas and northern Colombia. It was first discovered on Santa Martha by Purdie, who sent it to the Duke of Northumberland, in whose gardens at Syon House it flowered in 1851. It has since been occasionally imported from Caracas with *Cattleya labiata Mossiæ.* The specific name was suggested by the absence of the stalk or *unguis* in the sepals and petals, so generally characteristic of Oncids.

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* Fol. Orch. Oncid. No. 4. † Paxt. Fl. Gard. II. t. 63. ‡ Gard. Chron. 1873, p. 915.

‖ Gard. Chron. 1873, p. 915.

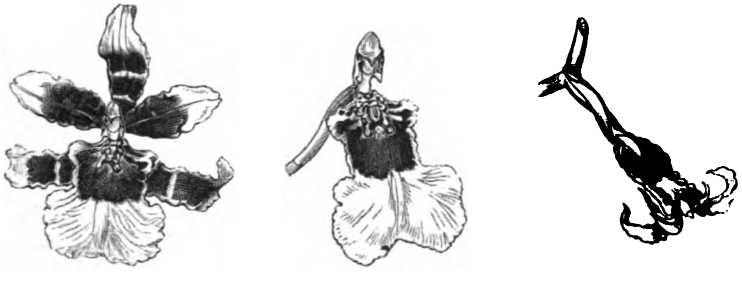
§ Id. XXIII. (1885), p. 756. ** Gard. Chron. XIX. (1883), p. 368, with fig.

On. sphacelatum.

Pseudo-bulbs nearly oblong, compressed with acute edges, 4—6 inches long, di-triphyllous. Leaves linear-ligulate, somewhat rigid, 15—24 inches long. Scapes 3—5 feet long, mottled with dull purple, much branched, the branches short. Flowers numerous, brightly coloured, exceeding an inch in diameter; sepals and petals narrowly oblong, undulate, reflexed at the tip, dark chestnut-brown barred with yellow; lip sub-panduriform, golden yellow with a red-brown band in front of the crest; crest a fleshy plate, three-lobed in front, toothed at the sides. Column wings small, oblong, depressed.

Oncidium sphacelatum, Lindl. Sert. Orch. sub. t. 48 (1838). Id. *Bot. Reg.* 1842. t. 30. Id. Fol. Orch. Oncid. No. 151. On. Massangei, Morren in *Belg. hort.* 1877, p. 124.

A handsome species, well known as one of the most useful of Oncids in a horticultural sense, being of easy culture and constantly flowering during April—June. It was first collected for the Horticultural Society of London in southern Mexico by Hartweg, in 1840, and shortly afterwards it was received from Honduras by Messrs. Loddiges, in whose nursery it flowered for the first time in this country in February, 1841. It was next sent from Guatemala by Mr. G. Ure Skinner to Mr. Bateman and other amateurs, and has doubtless been in cultivation ever since. A peculiarity by which *Oncidium sphacelatum* may be recognised is seen in the bud just before expansion; the points of the sepals and petals are here always bent back like five recurved horns. The specific name *sphacelatum*



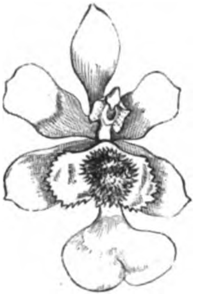
Oncidium sphacelatum.

(non-classical) is a fanciful one derived from σφάκελος, "tremor" or "agitation."[*]

On. sphegiferum.

Pseudo-bulbs broadly oval, almost orbicular, 1—1½ inches in diameter, much compressed, monophyllous. Leaves elliptic-oblong, 6—8 inches long, leathery, pale green. Scapes 3—4 feet long, panicled, many flowered. Flowers about an inch in diameter, bright orange with a reddish stain at the base of all the segments; sepals and petals clawed, the former oval, the latter oblong, apiculate; lip sub-pandurate in outline, the basal lobes rounded with denticulate margins, the front lobe transversely oblong, emarginate, of a lighter orange than the sepals and petals; crest oblong, cushion-like, minutely papillose. Column wings narrowly oblong.

Oncidium sphegiferum, Lindl in Bot. Reg. 1843, misc. 23. Id. Paxt. Fl. Gard. II. icon. xyl. No. 124. Id. Fol. Orch. Oncid. No. 117. Rolfe in Gard. Chron. III. s. 3 (1888), p. 716.



Oncidium sphegiferum.

First introduced from Brazil by Messrs. Loddiges in 1842—3, but we find no further evidence of its being in cultivation till 1887, when a plant, supposed to have been imported with *Oncidium divaricatum* or *On. pulvinatum*, flowered in our Chelsea nursery. An herbarium specimen was gathered by Miers at Corcovado, near Rio de Janeiro, thus indicating that its habitat is within the restricted area occupied by the members of the *Pulvinata* group, to which it belongs.[†] Its bright orange flowers render it distinct among the cultivated Oncids.

On. stramineum.

"Pseudo-bulbs none. Leaves 6—8 inches long, oblong-lanceolate, sub-acute, contracted into a short, stout petiole, very rigid, thick and coriaceous. Panicle stout, inclined or drooping, more or less branched. Flowers crowded, ¾ inch across, white speckled with red on the lateral sepals, lip and column; sepals and petals widely spreading, almost orbicular, the dorsal sepal concave; lip very shortly clawed, lateral lobes oblong, obtuse, falcately recurved; middle lobe broadly stalked, kidney-shaped, smaller than the lateral lobes; warts of the crest two on each side, more or less confluent. Column with broad wings."—*Botanical Magazine.*

Oncidium stramineum, Lindl. in *Bot. Reg.* 1838, misc. No. 63. Id. 1840, t. 14. Id. Fol. Orch. Oncid. No. 123. *Bot. Mag.* t. 6254.

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[*] In the *Gardeners' Chronicle*, 1842, p. 382, Dr. Lindley calls it the scorched Oncidium.

[†] See *Oncidium divaricatum*, p. 84.

One of the first orchids collected by Hartweg for the Horticultural Society of London during his mission to Mexico and Central America, 1837—42. He sent it from Vera Cruz in 1837, but as the plant was found in company with *Berberis tenuifolia* and other temperate forms, the true locality is probably on the eastern slopes of Orizaba at 3,000—4,000 feet elevation, one of the richest tracts of vegetation in Mexico. It belongs to a small sub-section of the genus (*Pauci-tuberculata* of Lindley) including *Oncidium cheirophorum, On. hians, On. Warneri,* and one or two others in which the crest consists of an even number of tubercles, 2—4.*

Although a pretty and distinct species with whitish or straw-coloured flowers with a pleasant primrose fragrance, it is now but rarely seen in cultivation.

On. suave.

Pseudo-bulbs ovoid, 3 inches long, compressed, ancipitous, with 2—3 shallow ribs on each of the flattened sides. Leaves linear, acuminate, 6 or more inches long. Peduncles slender, 18—21 inches long, paniculate, the branches short, distant and few flowered. Flowers fragrant, exceeding an inch in diameter; sepals and petals uniform, narrowly lanceolate, acute, reflexed at the tip, dark sepia-brown, obscurely keeled behind; lip bright yellow blotched with red-brown around the crest, three-lobed, the side lobes oval-oblong; the intermediate lobe broadly clawed, transversely oblong, emarginate; crest five-toothed, the central one much the largest. Column wings large, hatchet-shaped, bright yellow.

Oncidium suave, Lindl. in Bot. Reg. 1843, misc. No. 22. Id. in Paxt. Fl. Gard. II. fig. 135. Id. Fol. Orch. Oncid. No. 161. On. Wendlandianum, Rchb. in Bonpl. II. p. 91 (1850). On. macropterum, A. Rich. Orch. Mer. t. 32. On. lanceans, Hort. Sand. Cat. p. 46.

First imported from Mexico by Messrs. Loddiges through Deppe in 1835, and subsequently gathered by Schiede, Galeotti and other Mexican collectors in the neighbourhood of Oaxaca. We are indebted to Mr. F. W. Moore, of Glasnevin, for materials for description.

On. superbiens.

Pseudo-bulbs elongate-ovate, 3—4 inches long, compressed, monophyllous. Leaves broadly linear, almost ensiform, 12—15 or more inches long. Scapes flexuose, 4—5 or more feet long, branched at irregular intervals, the branches usually short and few flowered; bracts boat-shaped, sub-acute, ¾ inch long. Flowers 3—3½ inches in diameter; sepals clawed, wavy, reddish brown tipped with light yellow, the dorsal one somewhat trulliform with a cordate base, the lateral two ovate, obtuse; petals similar to the lateral sepals but smaller with a shorter claw, more undulate and reflexed at the apex, light yellow barred with brown on the basal half; lip plum-purple, "trulliform, auricled, shortly clawed with a raised tubercled yellow fleshy crest towards the base and a prominent acute tubercle on each auricle." Column yellow and brown with a small ascending auricle on each side of the stigma.

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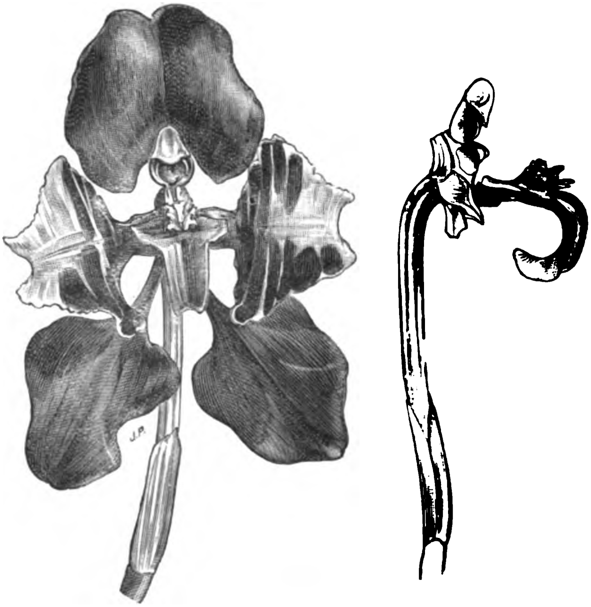
* The predominating number throughout Oncidium is five.

Oncidium superbiens, Rchb. in Linnæa, XXII. p. 843 (1848). Id. in Gard. Chron. 1872, p. 904. Lindl. Fol. Orch. Oncid. No. 9. *Bot. Mag.* t. 5980. Williams' *Orch. Alb. VI.* t. 276. On. undulatum, Williams' *Orch. Alb. VIII.* t. 368 (not of Lindl.)



Oncidium superbiens.

One of the handsomest of the Microchila Oncids, almost rivalling the handsome *On. macranthum* in the size and varied colouring of its flowers. It is a native of the eastern Cordillera of New Granada at 8,000—9,000 feet elevation; it was first detected by Purdie, about the year 1843, on Santa Martha, and by Fünck and Schlim between Pamplona and Ocaña, in 1847. It was introduced by us in 1871, and flowered for the first time in this country in our Chelsea nursery in the spring of the following year.

On. tectum.

Pseudo-bulbs broadly ovoid, compressed, an inch long, diphyllous. Leaves linear-ligulate, acute, 3—5 inches long. Peduncles slender, 18—24 inches long, sometimes racemed, oftener panicled, the branches zigzag and few flowered. Flowers ¾ inch in diameter, bright canary-yellow with 1—2 red-brown bars on each segment; sepals linear-oblong, acute, the lateral two free; petals broader, oval-oblong; lip with two rounded basal lobes and a transversely oblong deeply emarginate blade; crest a nearly circular disk with many tubercles, those at the circumference tooth-like. Column wings bipartite, the lower halves spreading, the upper halves prolonged and meeting above the anther.

Oncidium tectum, Rchb. in Gard. Chron. III. (1875), p. 780.

A species now rarely seen in other than Botanic gardens, introduced by us from New Granada, in 1874, through Gustav Wallis, who did not give the locality of this or indeed of any of his discoveries. The zigzag growth of the branches of the inflorescence is here more conspicuous than in any other Oncidium known to us. The applicability of the specific name is obscure.

On. tetrapetalum.

Pseudo-bulbs none. Leaves in tufts of 4—5 or more from a creeping rhizome, fleshy, triquetral with acute edges, equitant at the base, channelled on one side, 3—6 inches long. Scapes erect, dark purple, 18—24 inches high, racemose, or sparingly branched, many flowered. Flowers an inch across vertically; sepals and petals clawed, broadly oblong, sub-acute, undulate, keeled behind, the lateral sepals connate and concealed by the lip, bright chestnut-red barred and marked with yellow; lip broadly clawed, with two horn-like basal auricles and a transversely reniform, emarginate blade, white with a red blotch in front of the crest, which consists of seven tubercles, three in front and four in two pairs behind, all pointing forwards. Column wings somewhat scimitar-shaped, pale rose dotted with yellow.

Oncidium tetrapetalum, Wild. Sp. Plant. IV. p. 112, ex. Lindl. Gen. et Sp. Orch. p. 198 (1832). Lindl. Fol. Orch. Oncid. No. 36. On. pauciflorum, Lindl. Gen. et Sp. Orch. p. 198. On. tricolor, Hook. *Bot. Mag.* t. 4130 (1844). On. quadripetalum, Sw in K. Vet. Acad. Stockh. Nya. Handl. XXI. p. 240* (1800).

A very pretty species that was known to science in the last century, and which during the last sixty years has been frequently introduced into British gardens, but like most of the equitant Oncids has proved a refractory subject under cultivation. It is a native of the West Indies and adjacent countries on the American continent, Jamaica, Dominica, Mexico, Cumana (Venezuela) being among the recorded stations of this plant. It varies somewhat in habit and still more so in the colour of its flowers, and has received several names in consequence.

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* This is therefore the oldest name of this species, but being a mongrel word, half Latin, half Greek, it was rejected by the older botanists.

On. tigrinum.

Pseudo-bulbs sub-globose, compressed, 3—4 inches in diameter, di-triphyllous. Leaves linear-oblong, obtuse, folded at the base, 9—12 inches long. Scapes robust, erect, 24—36 inches high, loosely panicled; bracts small, subulate, appressed. Flowers about 3 inches across vertically, fragrant; sepals and petals similar and sub-equal, narrowly oblong, undulate, reflexed at the tip, bright yellow heavily blotched with brown; lip large and spreading, almost flat, wholly yellow, broadly clawed, the basal lobes small and rounded, the blade transversely and broadly oblong, emarginate; crest consisting of two short ridges and a large central one, terminating in three blunt teeth. Column wings ear-shaped.

Oncidium tigrinum, La Llave et Lex. Nov. Veg. Descript. p. 36 (1825). Lindl. Gen. et Sp. Orch. p. 203 (1832). Id. Fol. Orch. Oncid. No. 157. Williams' *Orch. Alb. III.* t. 137. *Rev. hort.* 1889, p. 176. Sander's *Reichenbachia, II.* pl. 88. On. Barkeri, Lindl. *Sert. Orch.* t. 48. Id. in Bot. Reg. 1841, misc. No. 174. Paxt. *Mag. Bot. XIV.* p. 97. *Illus. hort. I.* t. 2. Odontoglossum tigrinum, Lindl. Fol. Orch. Odont. No. 10 (1852).

var.—splendidum.

Pseudo-bulbs smaller and monophyllous, both pseudo-bulbs and leaves changing with age to a bronzy purplish brown. Peduncles shorter, usually racemed and fewer flowered. The sepals and petals are more reflexed, and the claw of the lip somewhat broader.

On. tigrinum splendidum, Hook. f. in *Bot. Mag.* t. 5878. Van Houtte's *Fl. des Serres, XVIII.* t. 1825. On. splendidum, A. Richard, *fide* Rchb. in Gard. Chron. 1870, p. 1213. De Puydt, *Les Orch.* t. 33. Williams' *Orch. Alb. VIII.* t. 373. Sander's *Reichenbachia, II.* t. 78. Godefroy's *Orchidophile*, 1891, p. 304.

var.—unguiculatum.

Panicles looser and the flowers smaller; the sepals and petals sometimes spotted, not barred; the claw of the blade of the lip longer and narrower.

On. tigrinum unguiculatum, Lindl. Fol. Orch. Oncid. No. 157. On. unguiculatum, Hort.

This fine Oncid was first made known to science by the Mexican botanists, La Llave and Lexarza, who gave a description of it in their *Novarum Vegetabilium Descriptiones*, published in 1825.* It was first cultivated in this country by Mr. Barker, of Birmingham, who introduced it from Mexico in 1839 or 40; it forms the subject of the last plate in Lindley's superb work, *Sertum Orchidaceum*, under the name of *Oncidium Barkeri*, in compliment to the introducer,

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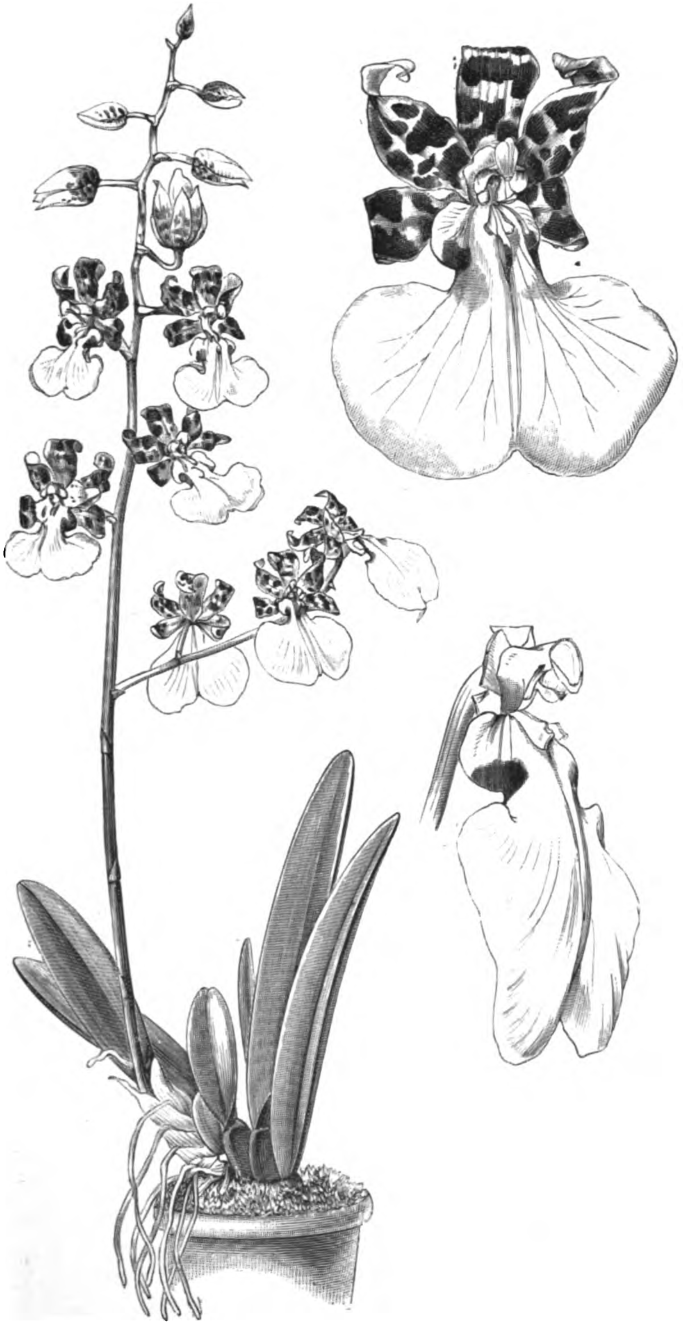
* That portion of it devoted to orchids is called *Opusculum Orchidaceum*.



Oncidium tigrinum, var. splendidum.

Lindley at that time failing to identify it with La Llave's *Oncidium tigrinum*. The habitat given by the Mexican botanists is the Irapean Mountains, not far from Valladolid, but a recent attempt to collect it there seems to have failed.* According to Lindley it was afterwards gathered by Ghiesbreght in Michoacan,† and many years later it was found by Roezl near Colima, on the mountains skirting the Pacific coast.‡

The variety *splendidum* first became known to the French botanist, Achille Richard, through a dried specimen, probably communicated to him by Galeotti; its introduction into French gardens is due to the late M. Quesnd, of Havre, who received plants from Guatemala about forty years ago,§ some of which he distributed among his friends, including M. Herment, of Caen, in Normandy, whence this gentleman's name became erroneously associated with its introduction. It does not appear to have found its way into British gardens till some years afterwards, the earliest occasion of its flowering in this country being in the collection of Lord Londesborough, at Norbiton, in the spring of 1870. It continued to be very rare for many years till a recent importation by Messrs. Sander and Co. has caused it to become generally distributed. Usually described in the horticultural periodicals as a species, it has but the slenderest claim to such a distinction, the characters relied upon to separate it from *Oncidium tigrinum* being chiefly the pseudo-bulbs and leaves, which are certainly distinct in aspect, but show no difference that might not have been brought about by local environment.‖ The variety *unguiculatum,* in which the structural deviations from the type as seen in the flowers are more conspicuous than in the variety *splendidum,* finds less favour with amateurs than either; it is occasionally imported with the species. *On. tigrinum* and its varieties flower in the winter months and continue a long time in bloom.

Oncidium tigrinum is called by the country people of Mexico Flor de Muertos, or "Flower of the Dead," in accordance with a custom that has prevailed in the country almost from the time of its first occupation by the Spaniards in the sixteenth century, by which all the most conspicuous native orchids have been associated with their religious observances.

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* Reichenbachia, II. p. 87.

† Fol. Orch. Oncid. No. 157.

‡ Belg. hort. XXXII. (1882), p. 100.

§ Godefroy's Orchidophile, 1891, p. 304.

‖ More convincing than anything we can say on this point is a comparison of the various coloured plates quoted in our literary references.

On. triquetrum.

Pseudo-bulbs none. Leaves in tufts of 3—4 or more, linear, acute, 3—5 inches long, fleshy, triquetrous, the angles very acute, channelled on one side. Scapes slender, longer than the leaves, terminating in a 10—15 flowered raceme. Flowers an inch across vertically; sepals broadly lanceolate, acute, purplish green, the lateral two connate and together equal to the dorsal one, bi-dentate at the tip; petals ovate, undulate, white tinged with pale green and spotted with purple; lip cordate-ovate with two rounded basal auricles, white spotted and streaked with purple; crest small, sub-globose, orange-yellow. Column wings oblong with the outer margin crenulate.

Oncidium triquetrum, R. Br. in Ait. Hort. Kew, ed. 2, vol. V. p. 216 (1813—15). Lindl. Gen. et Sp. Orch. p. 205 (1832). Id. Fol. Orch. Oncid. No. 30. *Bot. Mag.* t. 3393.

One of the prettiest of the equitant Oncids, although like its congeners and from the same cause it is but rarely seen in British gardens. It was originally introduced to the Royal Gardens at Kew by Admiral Bligh from St. Ann's, in Jamaica, in 1793; and again from the same island, to which so far as at present known it is confined, by Mr. Horsfall, of Liverpool, about 1833, by whom plants were distributed among the orchid collections at Wentworth, Chatsworth, etc. It is very near *Oncidium pulchellum,* from which it is easily distinguished by its very differently-shaped labellum.

On. trulliferum.

Pseudo-bulbs oblong, compressed, much elongated, 4—7 inches long, di-triphyllous, brownish green. Leaves variable in size, narrowly oblong or lanceolate-oblong, narrowed at the base, sub-acute, 6 – 9 or more inches long, 1—2 inches broad. Scapes about 2 feet long, loosely panicled along the distal third. Flowers nearly an inch across vertically, on short, slender pedicels, sheathed at the base by a minute auricular bract; sepals and petals bright yellow barred with red-brown, oval-oblong, obtuse, the dorsal sepal the shortest and concave, the lateral two free and divergent; lip bright yellow, broadly clawed with two rounded basal auricles and a trowel-shaped blade with serrulate margin; crest primarily three-lobed, each lobe much warted and toothed, the front lobe somewhat saddle-shaped, yellow, the posterior two divergent and spotted with red-brown. Column wings narrow; anther beaked.

Oncidium trulliferum, Lindl. in *Bot. Reg.* 1839, t. 59. Id. Fol. Orch. Oncid. No. 190. Regel's *Gartenfl.* 1877, t. 922.

"Originally imported from Brazil by Messrs. Loddiges, in whose nursery it flowered in September, 1838." This is all that has been published respecting its origin, and we find no precise habitat attached to herbarium specimens. Its native home is doubtless in the rich Oncidium region lying to the north and west of Rio de Janeiro. We are indebted to the Royal Gardens at Kew for materials for description.

On. unicorne.

Pseudo-bulbs oval-oblong, compressed, 2—3 inches long, diphyllous. Leaves linear-lanceolate, acute, 5—9 inches long. Scapes erect or inclined, as long again as the leaves, pale glaucous green, loosely panicled above. Flowers ¾ inch across vertically; sepals lanceolate, the lateral two connate almost to the apex, pale greenish or reddish brown; petals broader, oblong, undulate, red-brown tipped with light yellow, both sepals and petals reflexed; lip with a fleshy claw and sub-panduriform emarginate blade, of which the basal half is red and the apical half yellow; crest prolonged into an incurved reddish horn as long as the column. Column slender, wingless, but with the characteristic swelling below the stigma.

Oncidium unicorne, Lindl. in Bot. Reg. 1837, misc. No. 76. Id. Fol. Orch. Oncid. No. 71. Rchb. in Gard. Chron. XIV. (1880), p. 652 (pictum). On. monoceras, Hook. *Bot. Mag.* t. 3890.

First imported by Messrs. Rollisson from Rio de Janeiro in 1839, and shortly afterwards sent from that city by Mr. Hunt to the Duke of Bedford, in whose collection at Woburn Abbey it flowered in January, 1840. It has been reported from several localities in southern Brazil; it was detected by Gardner on the Organ Mountains, afterwards by Regnell in Minas Geraes, and later by Weir in São Paulo.

On. urophyllum.

Pseudo-bulbs none. Leaves equitant, ensiform, curved, 4—6 inches long, acuminate, dull dark green. Scapes slender, drooping, 18—24 inches long, dull brownish crimson, loosely panicled, many flowered. Flowers about an inch in diameter; sepals and petals yellow, blotched with chestnut-brown, the sepals linear-acute, the lateral two connate almost to their apex; the petals obovate, apiculate; lip three-lobed, canary-yellow, the basal lobes small, obovate; the front lobe clawed, broadly reniform with a sinus in the anterior margin; crest red and white, consisting of eight teeth arranged somewhat in quincuncial order. Column wings dolabriform, spreading.

Oncidium urophyllum, Lind. Sert. Orch. sub. t. 48 (1838). Id. *Bot. Reg.* 1842, t. 54. Id. Fol. Orch. Oncid. No. 33. Rolfe in Gard. Chron. IX. s. 3 (1891), p. 701.

First cultivated by Messrs. Loddiges in 1840—41, who informed Dr. Lindley that it had been imported from Brazil, which, however, is an error, as the plants cultivated in the Royal Gardens at Kew were received from the West Indian Island of Antigua, the only authentic habitat of the plant yet known. It is one of the equitant Oncids with tail-like leaves that suggested the specific name, from ὀύρα, "a tail," and φύλλον, "a leaf." We are indebted to the Royal Gardens at Kew for materials for description.

On. varicosum.

Pseudo-bulbs oval-oblong, compressed, furrowed, 3—4 inches long, di-rarely tri-phyllous. Leaves ligulate-lanceolate, 6—9 inches long. Scapes nodding, glaucous, 3—5 feet long, flexuose and branched beyond the middle. Flowers variable in size, attaining their maximum in the variety *Rogersii*; sepals and petals small and inconspicuous, dull yellow barred with pale red-brown; dorsal sepal oval, concave; lateral sepals connate to beyond the middle, obovate; petals narrowly oblong with crisped margin; lip very large, bright yellow, sometimes with a red-brown blotch in front of the crest, the basal auricles roundish, the blade transversely and broadly reniform, 2—3 lobed; crest consisting of "two triple teeth one standing before the other, and of a little ring of varicose veins placed on each side of it." Column wings oblong, denticulate.

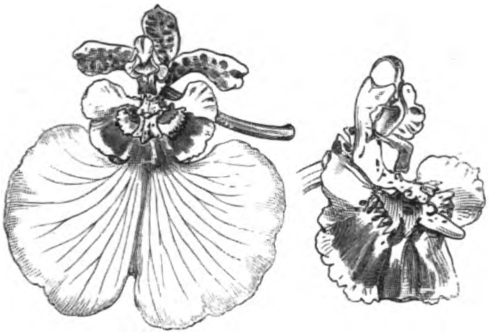
Oncidium varicosum, Lindl. in Bot. Reg. sub. t. 1920 (1837). Id. in Journ. Hort. Soc. Lond. V. p. 143 (1850). Id. Fol. Orch. Oncid. No. 79.

var.—Rogersii.

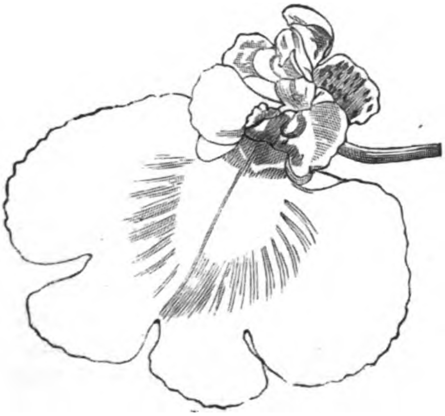
Panicles much larger and more spreading. Flowers the largest of all the forms of *Oncidium varicosum;* the blade of the lip fully 2 inches across, and made four-lobed by three deep clefts in the anterior margin.

On. varicosum Rogersii, Rchb. in Gard. Chron. 1870, p. 277, with fig. *Fl. Mag.* 1870, t. 477. *Florist and Pomol.* 1870, p. 25. Warner's *Sel. Orch. II.* t. 31. Jennings' *Orch.* t. 29. *Belg. hort.* 1878, p. 172.

Oncidium varicosum first became known to Dr. Lindley about the year 1837, through a specimen in the herbarium of Dr. Martius, which had been gathered in Brazil by Prince Maximilian, of Wied Neuwied. It was introduced to European gardens by M. de Jonghe, of Brussels, through Libon, who had rediscovered it in 1846 growing on the trunks of large trees in the neighbourhood of Yta, in the province of São Paulo. M. de Jonghe, in 1848, presented a plant to the Horticultural Society of London, which flowered in the Society's garden at Chiswick in the following year, the first occasion of its flowering in this country. The variety *Rogersii* first appeared in the collection of Dr. Rogers, of East Grinstead, who exhibited it at a meeting of the Royal Horticultural Society in November, 1868, when it was generally recognised as one of the finest Oncids ever seen in cultivation; it has always been extremely rare. The specific name, from *varex*, "a swollen vein," was suggested by the ring of varicose veins around the crest of the labellum.



Oncidium varicosum.



Oncidium varicosum var. Rogersii.
(From the *Gardeners' Chronicle.*)

On. viperinum.

Pseudo-bulbs ovoid, obscurely four-angled, an inch long, diphyllous. Leaves linear-oblong, acute, 2 inches long, pea-green. Peduncles slender, erect, 5—7 or more inches long, few flowered. Flowers about an inch in diameter; sepals and petals small, much undulated, pale red-brown barred with light yellow; the upper sepal elliptic-oblong, incurved, the lateral two free; the petals oblong, reflexed; lip canary-yellow, with two small rounded basal auricles and a large transversely oblong, emarginate blade; crest very complex, mainly a fleshy bipartite protuberance toothed and warted, and with two small teeth on each side. Column wings small, rounded.

Oncidium viperinum, Lindl. Gen. et Sp. Orch. p. 197 (1832). Id. Fol. Orch. Oncid. No. 77. On. confragosum, Lindl. in Bot. Reg. 1838, misc. No. 92.

Originally discovered by Tweedie in the early part of the present century, growing upon dead trees in Uruguay, in the neighbourhood of Montevideo. Coming from the same country as *Oncidium bifolium*, which it much resembles in habit, Dr. Lindley aptly compared it with that species, from which it is distinguished by its differently shaped pseudo-bulbs, its longer peduncles bearing smaller flowers with a different lip, and especially by its crest. The curious form of the latter, which Lindley fancifully likened to a cluster of young vipers' heads as seen in profile, suggested the specific name.

On. volvox.

Pseudo-bulbs oval-oblong, 2—4 inches long, compressed, ribbed and furrowed on the flattened sides, diphyllous. Leaves narrowly ligulate, sub-acute, 8—12 inches long, complicate at base. Scapes very slender, brownish, flexuose, 3—5 feet long, with a minute whitish bract at each joint, branched at short intervals, the branches 2—3 flowered. Flowers an inch in diameter; sepals and petals similar and equal, linear-oblong, obtuse, undulate, yellow much spotted with red-brown to two-thirds of their length, the lateral sepals free and spreading parallel with the petals; lip sub-panduriform, the basal lobes roundish oblong, convex, bright yellow; the front lobe with a short broad claw, transversely oblong, emarginate, canary-yellow with a red-brown band around the crest, paler beneath; crest consisting of a central raised plate bidentate at the apex, and with 5—7 teeth on each side in two uneven rows. Column wings narrow.

Oncidium volvox, Rchb. in Bonpl. II. p. 13 (1854). Id. Xen. Orch. I. p. 234, t. 99, No. 1. Lindl. Fol. Orch. Oncid. No. 156.

Discovered by Wagener in the vicinity of Caracas, and sent by him to Herr Keferstein, in whose collection at Halle, in Germany, it flowered for the first time in Europe in 1854. We find no record of its first introduction into British gardens. The above description was taken from a plant that flowered in our houses in the autumn of 1891, and about the same time we received an inflorescence from Mr. F. W. Moore, of Glasnevin. The specific name refers to the twining, convolvulus-like axis of the inflorescence.

On. Warscewiczii.

Pseudo-bulbs ovate-oblong, compressed with acute edges, mono-diphyllous. Leaves ligulate-cuneate, complicate at base, 7—10 inches long. Scapes 15—21 inches long, rendered ancipitous by opposite and alternate sheathing bracts, 10—15 or more flowered, the floral bracts triangular, acute, keeled, as long as the stalked ovaries. Flowers 1¼ inches across vertically, of a uniform golden yellow; dorsal sepal and petals oval-oblong with undulate margin; lateral sepals connate almost to the apex, concave above, two-keeled beneath; lip with a long and narrow claw, at the base of which are two small auricles, the blade sub-orbicular, bilobed with an apiculus in the sinus between the lobes; crest five-toothed. Column wings narrow.

Oncidium Warscewiczii, Rchb. in Bot. Zeit. 1852, p. 693. Id. in Gard. Chron. 1871, p. 560, and I. (1874), p. 48. Lindl. Fol. Orch. Oncid. No. 56. *Lindenia, II.* t. 88. On. bifrons, Lindl. in Gard. Chron. 1857, p. 84, *fide* Rchb. in. Gard. Chron. 1871, p. 675.

Originally discovered by Warscewicz on Chiriqui, in Veragua, growing upon oaks at 8,000—10,000 feet elevation, where the temperature often sinks to 5° C. (41° F.). It was imported by us from Costa Rica in 1870. It is one of the most distinct Oncids ever introduced, for although somewhat resembling in its large spathaceous bracts *Oncidium bracteatum* from the same region, the flowers are very different in shape and colour.

On. Warneri.

Pseudo-bulbs ovoid-conical, 1½ inches long, green spotted with dull purple, diphyllous. Leaves linear, grass-like, 5—6 or more inches long. Scapes slender, erect, racemose, 8—12 flowered. Flowers small but showy, about an inch across vertically; sepals and petals variable in colour, sometimes pale brown, sometimes yellow stained and streaked with purple towards their base; the sepals narrowly elliptic-oblong, the lateral two free; the petals similar but a little shorter and broader, also apiculate; lip bright yellow, four-lobed, the basal lobes rotund, the anterior lobes smaller, oblong, divergent; crest oblong thickened at the posterior end and with a shallow sunk line. Column wingless.

Oncidium Warneri, Lindl. Fol. Orch. Oncid. No. 125 (1855). Odontoglossum Warneri, Lindl. in Bot. Reg. 1845, misc. p. 54. *Id.* 1847, t. 20.

A remarkable Oncidium, more interesting perhaps in a botanical than in a horticultural sense. The labellum of the flower affords a striking instance of the polymorphism of that organ in Oncidium, but its simple crest is more that of an Odontoglossum; the absence of the "ears" or column wings would also bring it within that genus or even Miltonia; the protuberance at the base of the column in front, however, indicates its true place. It was first exhibited by Mr. C. B. Warner at a meeting of the Horticultural Society of London in May, 1845, and had probably been imported by Messrs. Loddiges from Mexico. We received materials for description from the collection of Sir Trevor Lawrence, Bart., at Burford Lodge, and from Mr. F. W. Moore, of Glasnevin.

On. Wentworthianum.

Pseudo-bulbs ovate-oblong, 3—4 inches long, compressed, furrowed, often barred and spotted with brown, diphyllous. Leaves ligulate, acute, 9—12 or more inches long. Scapes flexuose, several feet long, branched, the branches distant, slender, the longer ones again branched and many flowered. Flowers an inch or more in diameter; sepals and petals yellow blotched with red-brown except on the apical area, linear-spathulate, undulate at the margin, the two lateral sepals free and divergent; lip with two rounded pale yellow basal lobes, and a transversely oblong two-lobed blade, denticulate at the margin, yellow with some red-brown spots around the crest; crest triangular, toothed at each angle, with a smaller tooth on each side and two more in front of the apical angle. Column wings narrow.

Oncidium Wentworthianum, Batem. in Bot. Reg. 1840, misc. No. 194. Id. *Orch. Mex. et Guat.* t. 39. Lindl. Fol. Orch. Oncid. No. 195. Id. Paxt. Fl. Gard. II. icon. 127.

Oncidium Wentworthianum.

One of the numerous discoveries of Mr. G. Ure Skinner in Guatemala. He detected it on the mountains of Santa Rosa in 1839 and sent it to Mr. Bateman, in whose collection at Knypersley it flowered in the following year; it was subsequently sent to the Horticultural Society of London from the same country by Hartweg. It was named in compliment to Earl Fitzwilliam, whose collection of orchids at Wentworth, near Rotherham, was at that time one of the finest in England.

On. Widgrenii.

Pseudo-bulbs oblong, thickened at the middle, 2 inches long, monophyllous. Leaves narrowly oblong, acute, 4—5 inches long. Scapes slender, sub-erect or nodding, about a foot high, racemed or panicled, 12—15 or more flowered. Flowers about an inch in diameter, brightly coloured; sepals yellow with narrow transverse red-brown bars, the dorsal one oblong-cuneate, obtuse, the lateral two linear-oblong, connate at the base; petals like the dorsal sepal, but wholly red-brown and undulate at the margin; lip with a long claw, three-lobed, the side lobes linear, incurved, yellow, the front lobe roundish, emarginate, red-brown; crest consisting of a large number of tubercles running down the centre from the base to the front lobe. Column with two large incurved wings and a small apical hood.

Oncidium Widgrenii, Lindl. Fol. Orch. Oncid. No. 50. Rolfe in Gard. Chron. V. s. 3 (1889), p. 557.

This is probably a very rare species, with a restricted habitat. Prior to 1889 nothing was known of it beyond an herbarium specimen gathered by Widgren in the Brazilian province of Minas Geraes, preserved at Kew, and the description and note in Lindley's *Folia Orchidacea.* In the year mentioned, Mr. Draper, gardener to the Marquis of Londonderry, at Seaham Hall, near Sunderland, sent the inflorescence of an Oncidium to Kew for identification, and shortly afterwards supplied us with the materials from which our description was taken, and which were identified for us by Mr. Rolfe, of the Kew Herbarium. Mr. Draper states that the plants came from the neighbourhood of Rio de Janeiro. It is a handsome species with bright-coloured flowers that should be sought for by the collectors of Brazilian orchids.

On. xanthodon.*

"Pseudo-bulbs narrow-ovoid, much compressed, 5 inches long, monophyllous. Leaves 18—24 inches long and 2—2½ inches broad, narrow linear-obovate, acute. Scape very slender, 6—8 feet long, much branched, twining, greenish brown; branches slender, flexuous; bracts ovate-lanceolate, ½ inch long; ovary and pedicel together nearly 2 inches long. Flowers 1½ inches in diameter, of a rich chocolate-brown with golden crisped and crenate edges; sepals and petals very similar, waved and reflexed, clawed; blade broadly ovate, rounded or almost hastate at the base; lip smaller and narrower than the petals; basal portion irregularly quadrate, sessile, two-lobed at the apex; disk prominent with several tubercular calli which are yellow, shining, and viscid; blade spathulate, recurved, acute. Column short, curved like the letter S, with small lateral wings at the apex."—*Botanical Magazine.*

Oncidium xanthodon, Rchb. in Gard. Chron. 1868, p. 1338. *Bot. Mag.* t. 5756.

Introduced in 1868 from the Ecuadorean Andes by Messrs. Backhouse, of York. Although closely allied to *Oncidium serratum,* and originating in the same region as the group of Oncids noticed under that species, the plate and description in the *Botanical Magazine* show that it is sufficiently distinct to require separate notice, and that it is one of the series of *serratum* affinities that will doubtless retain its specific rank.

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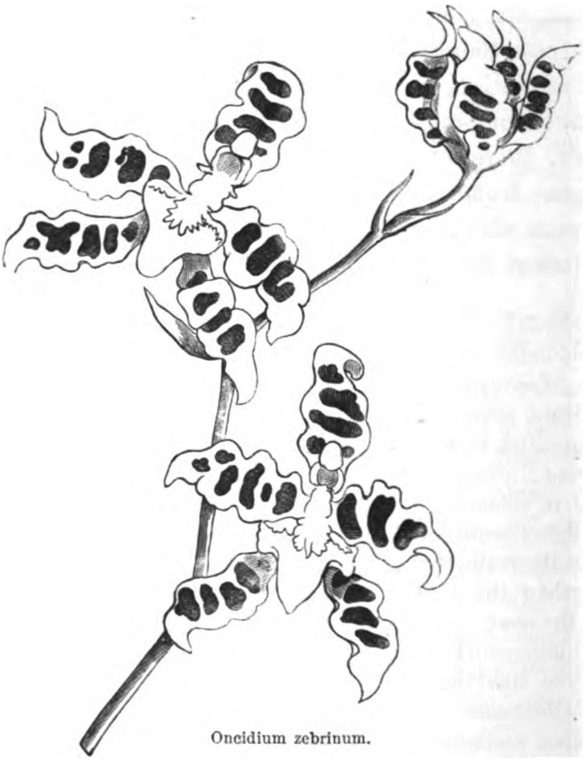
* Not seen by us.

On. zebrinum.

Rhizome almost as thick as the little finger, sheathed by the persistent whitish bases of the fallen scales that are lanceolate and at first brownish. Pseudo-bulbs produced from the rhizome at intervals of 4—6 inches, ovoid-oblong, compressed, 4—5 inches long and 2 inches broad at the widest, diphyllous. Leaves ligulate, acute, 10—15 inches long. Panicles flexuose, 7—10 or more feet long, the branches short and few flowered. Flowers 1½ inches in diameter; sepals and petals similar and sub-equal, narrowly oblong, much undulated, reflexed at the apex, white with 5—7 zebra-like, transverse, red-brown stripes; lip smaller than the other segments, sub-quadrate at the base, oblong-triangular, reflexed, white spotted with red-brown; crest oblong, tuberculated, bright yellow sometimes marked with red. Column wings reduced to two small teeth.



Oncidium zebrinum.

(From the *Gardeners' Chronicle.*)

Oncidium zebrinum, Rchb. in Bonpl. II. p. 12 (1854). Id. Gard. Chron. 1872, p. 1355, with fig. Lindl. Fol. Orch. Oncid. No. 16. *Bot. Mag.* t. 6138. Odontoglossum zebrinum, Rchb. in Linnæa, XXII. p. 849 (1849). Lind. Fol. Orch. Odont. No. 40.

Native of the Cordillera of Venezuela, in the province of Caracas, where it was discovered, probably by Moritz, in 1847, and whence it has been sent to Europe, dried or living, by various collectors. It flowered for the first time in England in Mr. Bull's nursery at Chelsea, in September, 1872. The species is readily distinguished by its long, creeping rhizome, more marked in this respect than any other Oncid known to us; also by its white zebra-striped flowers, which much resemble those of an Odontoglossum.

MILTONIA.

Lindl. in Bot. Reg. sub. t. 1976 and t. 1992 (1837). Id. Fol Orch. 1853. Benth. et Hook. Gen. Plant. III. p. 563 (1883).

Miltonia is one of the comparatively few genera of orchidaceous plants of which the whole of the included species are more or less worthy of cultivation, and it is here accordingly monographed in its entirety. In addition to the handsome species long cultivated in gardens as Miltonias, a group of orchids whose flowers are of exceptional beauty are now included in the genus, but which have hitherto been generally known as Odontoglossums; these, however, conform so much more closely to the generic characters of Miltonia than to those of Odontoglossum that they are unhesitatingly referred to the former genus by botanists, and accepted as such by many horticulturists. The genus Miltonia, in this enlarged sense, is on the whole a natural one that may be conveniently retained both in scientific classification and for garden use, although there are difficulties in technically defining its limits.*

The relationship subsisting between Miltonia, Odontoglossum and Oncidium has been already noticed in the introductory notes to the synopsis of those genera, but in treating of Miltonia we are brought into contact with another genus, Brassia, which although separated from Miltonia by fairly well-expressed characters, and the included species of which are usually recognised by horticulturists by the very distinct aspect of their inflorescence, nevertheless follows so closely after Miltonia that the two genera merge into each other in *Miltonia flavescens*, which may, with almost equal right, be referred to either.

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* Reichenbach monographed Miltonia, as far as it was then known, in his *Xenia Orchidacea*, vol. I. p. 128, published in 1855, but removed the whole of the species, together with those of Brassia, to Oncidium, when compiling his Synopsis of the Orchideæ for Walper's *Annales Botanices*, vol. VI. published in 1863, placing both series between Lindley's sub-sections *Integrilabia* and *Pulvinata*.

It will be convenient in this place to recapitulate briefly the characters by which Miltonia is chiefly separated from the closely related genera just mentioned—

> From Odontoglossum.—By the short column, the wings of which are very narrow and usually entire. By the sessile labellum affixed to the base of the column and spreading from it at a considerable (usually a right) angle, the crest of which is either obsolete or reduced to a few short raised lines.
>
> From Oncidium.—By the absence of tumidity in the column below the stigma. By the sessile and almost entire labellum destitute of a tuberculated or toothed crest. By the floral segments being nearly always in one plane, in many of the species quite flat, the lateral sepals being always free.
>
> From Brassia.—By the winged or auriculate column. By the broader and shorter sepals and petals that are not elongated (except in *Miltonia flavescens*) into linear acuminate segments.

In their vegetation the Miltonias conform to Odontoglossum, under which the vegetative organs have been fully described. It should be noted, however, that a deviation from the usual dark green that prevails throughout Odontoglossum is observable in many of the species of Miltonia. Thus—in *Miltonia spectabilis* and other Brazilian species the pseudo-bulbs and foliage are of an ochreous yellow tint, in *M. Roezlii* and other Colombian species they are of a pallid hue, and in *M. vexillaria* they are glaucescent, characters which serve as distinguishing marks of those species.

The genus was founded by Dr. Lindley on *Miltonia spectabilis* and dedicated to the late Earl Fitzwilliam (Viscount Milton), "one of the oldest and most zealous friends of Natural Science in this country." It includes fourteen species, two supposed natural hybrids and one artificial hybrid raised in European gardens.

Geographical Distribution.—The geographical distribution of the Miltonias is somewhat peculiar and analogous in a restricted sense to that of the Cattleyas, for they occur in two regions of South America, separated from each other by an interval of upwards of 3,000 miles. One group of species is confined to a limited area in southern Brazil in the immediate neighbourhood of Rio de Janeiro, and another group is restricted to northern Ecuador and Colombia. One (*Miltonia Endresii*) has its station in Costa Rica, and the precise habitat of one (*M. Schroederiana*) has not been divulged, but is vaguely stated to be Central America. Very little too has been divulged respecting the habitats of the Brazilian species and of their environment *in situ,* but coming from the neighbourhood of Rio de Janeiro, the climatic conditions under which they live are known by analogy and from cultural experience to be much the same as those described under Cattleya at page 3. The Colombian species are found on the Cordilleras at 1,000—6,000 feet elevation,* where the atmosphere is very humid throughout the year.

Cultural Note.—The cultural treatment of the Miltonias, so far as regards the potting, watering, and ventilation, is essentially the same as that formulated under Odontoglossum (page 10—11). The Miltonias, however, grow under climatic conditions somewhat different from those under which the greater part of the Odontoglots are found, especially in respect of temperature, and this circumstance has to be taken into account in their cultural treatment. Moreover the climatic conditions under which the Brazilian species live in their native home are not quite the same as those of the Colombian species, for their seasons are opposite; hence for cultural purposes the Miltonias arrange themselves into two groups.

All the members of the Brazilian group, that is to say, *anceps, candida, Clowesii, cuneata, flavescens, Regnelli, Russelliana,* and *spectabilis* with its numerous varieties and the two supposed natural hybrids of Brazilian origin, require an intermediate temperature such as is maintained in the Cattleya house, where it ranges throughout the year from 13° to 20° C. (55°—70° F.) by fire-heat, with such increments by sun-heat as circumstances admit, the higher temperatures being of course attained in summer when the plants are in active growth, and when they should be liberally supplied with water. On warm bright days the Miltonias must be shaded from the direct rays of the sun during the middle hours of the day, but at other times they should receive as much light as possible. ***Miltonia spectabilis*** and its varieties being plants with creeping rhizomes are usually cultivated in shallow pans with about an inch of compost about their roots which should at no time be allowed to get dry.

Of the Colombian Miltonias that have pallid pseudo-bulbs and foliage, *vexillaria, Phalænopsis* and *Endresii* require a temperature of 10°—13° C. (50°—55° F.) by fire-heat, allowing it to rise by sun-heat during the growing season to 15°—20° C. (60°—70° F.); but too great a deviation from the mean should be avoided. These readings correspond nearly with Cattleya temperatures, but as this group of Miltonias is found to thrive better under a more equable temperature throughout the year than under the wider range allowed to Cattleyas, it is the practice of many cultivators to place them with, or under the same conditions as Cattleyas during the winter months, and to remove them to the Odontoglossum house in the summer. *Miltonia Roezlii* requires more heat and more shade, and may be cultivated in pans suspended near the roof-glass of the warmest house. *M. Warscewiczii* also requires more heat and shade than either the Brazilian or Colombian species except *M. Roezlii*. *M. Schroederiana* is a rare species of which we have had no cultural experience. All the Colombian Miltonias are naturally found in shady and moist situations; under cultivation therefore the supply of moisture must not be intermittent, but simply varied in amount according to the season of the year. Those with pallid pseudo-bulbs and leaves are particularly liable to the attacks of thrip and red-spider, and the freeing of the plants from these pests is one of the most onerous duties of the cultivators of them.

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* *Miltonia Roezlii* and *M. Warscewiczii* in the lower and hotter zone, and *M. vexillaria* and *M. Phalænopsis* in the higher zone, occasionally associated with Cattleyas.

SYNOPSIS OF SPECIES AND VARIETIES.

Miltonia anceps.

"Pseudo-bulbs oblong, compressed, 2—3 inches long, diphyllous. Leaves linear-oblong, sub-acute, 4—6 inches long. Peduncles longer than the leaves, two-edged, sheathed by long, alternate, compressed bracts, one flowered. Flowers 2—2½ inches in diameter; sepals and petals similar, oblong-lanceolate with recurved tips, yellow-green; lip sub-panduriform, white with 2—3 purple longitudinal streaks on the disk, in front of which are a few purple spots; basilar lamellæ two, with a small tooth between them. Column wings purple."—*Botanical Magazine.*

Miltonia anceps, Lindl. Fol. Orch. Milt. No. 7 (1853). Rchb. *Xen. Orch. I.* p. 56, t. 21. *Bot. Mag.* t. 5572. Odontoglossum anceps, Klotzsch in Allg. Gartenz. 1851, p. 250. Oncidium anceps, Rchb. in Walp. Ann. VI. p. 758 (1863).

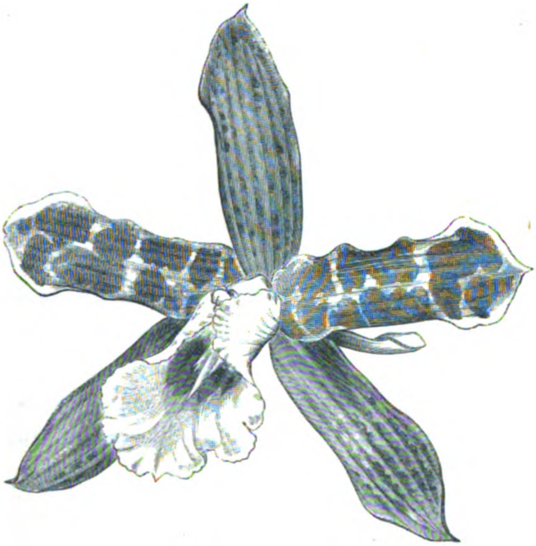
Originally introduced by Messrs. Loddiges from Brazil, and subsequently, about the year 1850, it was sent to Herr Jenisch's collection at Flotbeck, near Hamburg, by Allardt. It was re-introduced by Messrs. Low and Co. in 1864, through their collector Blunt, and flowered in Mr. Bateman's collection at Knypersley in the spring of the following year. We find no record of its habitat nor any notice of its having flowered in this country since the last mentioned date.

M. candida.

Pseudo-bulbs ovoid, elongated, compressed, 3—4 inches long, diphyllous. Leaves linear-oblanceolate, acute, complicate at base, 9—15 inches long.

Peduncles stoutish, 15—20 inches long, 3—5 flowered. Flowers 3 inches in diameter; sepals and petals similar and sub-equal, narrowly oblong, apiculate, chestnut-brown tipped and spotted with yellow; lip roundish obovate with undulate margin, convolute into a broad funnel like tube, white with two light violet-purple blotches on the disk, and with 5—7 raised lines that are slightly divergent, of which the two next the middle one are more prominent than the others. Column with a narrow wing on each side of the stigma.

Miltonia candida, Lindl. in Bot. Reg. 1838, misc. No. 29, and 1845, sub. t. 8. Id. *Sert. Orch.* t. 21. Id. Fol. Orch. Milt. No. 9. Paxt. *Mag. Bot. VI.* p. 241. *Bot. Mag.* t. 3793 (flavescens). Rchb. *Xen. Orch. I.* p. 132, t. 54 (Jenischiana). Williams' *Orch. Alb. V.* t. 200 (grandiflora). Oncidium candidum, Rchb. in Walp. Ann. VI. p. 763 (not Lindl.)



Miltonia candida.

Long known as one of the handsomest of the Brazilian Miltonias, but of which nothing has been recorded of its habitat or of its discovery. It flowered for the first time in this country (imperfectly) in Messrs. Loddiges' nursery in 1838. According to Sir William Hooker it was originally imported from Brazil by the Earl of Arran, by whom it was communicated to the Royal Botanic Garden at Glasnevin, whence were derived the materials for the plate and description in the *Botanical Magazine.* The species is slightly variable in the colour of its flowers which are produced in the autumn months.

M. Clowesii.

Pseudo-bulbs narrowly ovate-oblong, compressed, attenuated upwards, 3—4 inches long, diphyllous. Leaves linear-ligulate, 12—18 inches long. Peduncles nearly as long again as the leaves, racemose along the distal half, 7—10 flowered. Flowers 2—3 inches in diameter; sepals and petals similar and sub-equal, lanceolate, acuminate, chestnut-brown barred and tipped with yellow; lip sub-panduriform, produced at the apical margin to an acuminate point, the basal half violet-purple the distal half white; crest consisting of 5—7 raised lines of unequal length that are sometimes white, sometimes yellow, of which the middle one is the broadest, and the two next to it are the longest. Column wings very narrow, entire.

Miltonia Clowesii, Lindl. *Sert. Orch.* t. 34 (1839). Id. Fol. Orch. Milt. No. 3. *Bot. Mag.* t. 4109. Paxt. *Mag. Bot. IX.* p. 241. Rchb. Xen. Orch. I. p. 130. Regel's *Gartenfl. III.* t. 160. *Belg. hort.* 1876, p. 174. Odontoglossum Clowesii, Lindl. in Bot. Reg. 1839, misc. 153. Brassia Clowesii, Lindl. in Bot. Reg. 1844, misc. p. 7. Oncidium Clowesii, Rchb. in Walp. Ann. VI. p. 760 (1863).

sub-var.—*castanea* (Rchb. Xen. Orch. I. p. 30), sepals and petals chestnut-brown, paler towards the tips, stained with plum colour at the base; lip wholly plum-purple, shaded with maroon at the base, paler at the apex.

Miltonia Clowesii was first detected by Gardner in a ravine of the Organ Mountains, and sent by him to the Rev. John Clowes, in whose garden at Broughton Hall, near Manchester, it flowered in the autumn of 1839. It has been occasionally received since from correspondents in Rio de Janeiro and the adjacent province of Minas Geraes. The sub-variety *castanea*, which is a very handsome form, that was first noticed by Reichenbach many years ago, recently reappeared in our houses, when the above description was taken.

M. cuneata.

A robust plant with a stoutish creeping rhizome. Pseudo-bulbs ovate-oblong, compressed, 3 — 4 inches long, diphyllous. Leaves narrowly lanceolate, acute, 9—15 inches long. Peduncles as long again as the leaves, erect, racemed above, 5—8 flowered; bracts triangular, acute, glumaceous. Flowers 2½—3 inches in diameter; sepals and petals similar, oblong-lanceolate, acuminate, with recurved tips and undulate margin, chestnut-brown tipped with light yellow and sometimes with a few yellow streaks near the base; lip white with a long narrow claw and sub-quadrate, undulate blade, on the disk of which are two slightly divergent raised plates that are sometimes spotted with rose. Column wings narrow, denticulate.

Miltonia cuneata, Lindl. in Bot. Reg. 1844, misc, No. 28. *Id.* 1845, t. 8. Id. Fol. Orch. Milt. No. 8. Rchb. Xen. Orch. I. p. 131. *Illus. hort.* 1860, t. 237. Williams' *Orch. Alb. I.* t. 46. M. speciosa, Klotzsch in Allg. Gartenz. XVII. p. 129. Oncidium speciosum, Rchb. in Walp. Ann. VI. p. 761 (1863).

The first notice of *Miltonia cuneata* occurred in 1844, at which date it was cultivated by Messrs. Rollisson at their nursery at Tooting; many years afterwards it was sent to M. Verschaffelt's horticultural establishment at Ghent by a French correspondent, M. Pinel, from Brazil. Beyond this not a scrap of information is forthcoming respecting its habitat, its discoverer, or the date of its introduction.

M. Endresii.

Pseudo-bulbs ovate-oblong, compressed, 1½—2 inches long, monophyllous. Leaves linear-lanceolate, acute, 9—12 inches long, pale green. Scapes as long as the leaves, slightly compressed, pale green, 3—5 flowered; bract small, acute, appressed. Flowers flat, 2¼ inches in diameter, on rather long pedicels, white with a light red-purple blotch at the base of each segment; sepals and petals similar and sub-equal, oval-oblong, acute, the dorsal sepal apiculate; lip broadly panduriform, the basal lobes small, roundish, the front lobe with a shallow sinus in the anterior margin; crest semi-lunate, produced into three short keels in front, pubescent, bright yellow. Column wings very narrow, light rose-purple.

Miltonia Endresii, Nicholson, Dict. Gard. II. p. 368 (1886). Odontoglossum Warscewiczii, Rchb. in Bot. Zeit. 1852, p. 692. Id. Gard. Chron. III. (1875) p. 270. Id. *Xen. Orch. I.* p. 208, t. 81. *Bot. Mag.* t. 6163. Lindl. Fol. Orch. Odont. p. 24.

This is one of the rarest species of the genus; it was discovered by Warscewicz about the year 1849 on the Cordillera of Veragua, at 4,500—6,000 feet elevation, growing upon leguminous trees; it was detected by its discoverer only in two localities, in both of which the plants appeared to be very restricted in numbers. Twenty-two years afterwards it was re-discovered by Wallis while collecting plants for M. Linden, but who failed to introduce it into European gardens. It was not till 1873, when it was found by Endres while collecting plants for us in Central America, that its introduction was at length effected under very difficult circumstances. The first introduction consisted of a single plant only, and a very small one too, all the others collected with it having perished during transmission; but two years later Endres succeeded in bringing home a few plants, one of which flowered in our Chelsea nursery in 1875. As a species it is distinct, its systematic place being between *M. Phalænopsis* and *M. Roezlii.*

M. flavescens.

Pseudo-bulbs oval-oblong, 4—5 inches long, compressed, diphyllous. Leaves linear-ligulate, about a foot long. Scapes longer than the leaves sheathed by distichous and alternate pale brown membraneous bracts, the floral bracts linear, acuminate, longer than the pedicels. Raceme 7—10 flowered; sepals and petals linear-oblong, acute, 2 inches long, straw-yellow, the petals a little broader and shorter than the sepals; lip shorter than the other segments, ovate-oblong, acute with undulate margin, slightly contracted below the middle, white streaked and marked with red-purple on the basal half, which is also pubescent and traversed by 4—6 radiating lines. Column wings obsolete.

Miltonia flavescens, Lindl. Sert. Orch. sub. t. 48 (1839). Id. in Bot. Reg. 1845, sub. t. 8. Id. Fol. Orch. Milt. No. 6. Rchb. Xen. Orch. I. p. 129. Regel's *Gartenfl.* 1890, t. 1328. Cyrtochilum stellatum, Lindl. Sert. Orch. t. 7. C. flavescens, Lindl. in *Bot. Reg.* t. 1627 (1833). Oncidium flavescens, Rchb. in Walp. Ann. VI. p. 757 (1863).

Originally discovered by the French traveller and naturalist, Descourtilz, in the early part of the present century, near Bananal, in the Brazilian province of Minas Geraes, and subsequently gathered by Regnell, Miers, and other botanists in southern Brazil. It was introduced in 1832 by Mr. William Harrison, a British merchant residing at Rio de Janeiro, who sent plants to his brother Richard at Aigburth, Liverpool. In a horticultural sense the species is not in high repute, but it is botanically interesting as connecting Miltonia with Brassia, it differing from the last named genus in little except the stellate arrangement of the sepals and petals, which are nearly of equal length, and the long acuminate bracts.

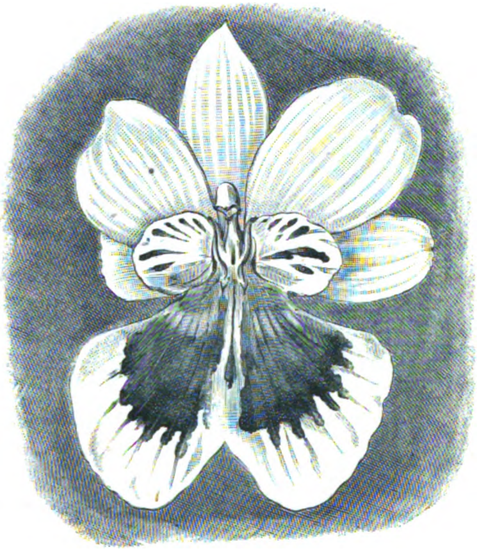
M. Phalænopsis.

Pseudo-bulbs ovoid, compressed, 1—1½ inches long, pale green, mono-diphyllous. Leaves linear, 5—9 inches long, complicate at base, tapering at apex, pale green. Scapes shorter than the leaves, 3—5 flowered. Flowers flat, 2—2½ inches in diameter; sepals and petals white, the sepals oval-oblong, acute, the petals broader, elliptic, obtuse; lip four-lobed, the basal lobes short, rotund, white with some light purple streaks; the anterior lobes larger, sub-quadrate, white blotched with light purple; crest with three small blunt teeth, on each side of which is a yellow spot. Column wings very short.

Miltonia Phalænopsis, Nicholson, Dict. Gard. II. p. 369 (1886), with fig. M. pulchella, Hort. ex Batem. Odontoglossum Phalænopsis, Rchb. in Bonpl. II. p. 278 (1854). Id. in Walp. Ann. VI. p. 844. Linden's *Pesc.* t. 44. Warner's *Sel. Orch. I.* t. 30. Batem. *Monogr. Odont.* t. 3.

This was the first of the group of Colombian Miltonias distinguished by their large flat flowers and pallid foliage that was introduced into European gardens, it having been sent to M. Linden's horticultural establishment at Brussels by Schlim, in 1850. Its principal station is on the western slopes of a branch of the eastern

Cordillera, almost parallel with the River Magdalena, near Ocaña; it grows chiefly on the trunks and branches of trees in more or less shade, and always in humid situations at 4,000—5,000 feet elevation; it also occurs in the Carara district under similar conditions, but at a lower elevation.



Miltonia Phalænopsis.

M. Regnelli.

Pseudo-bulbs ovate-oblong, compressed, 2—3 inches long, pale yellow-green, diphyllous. Leaves linear-ligulate, acute, about a foot long. Peduncles as long as, or longer than the leaves, 3—5 flowered. Flowers flat, 2—3 inches across vertically; sepals and petals white, sometimes faintly tinted with rose towards their base, the sepals oblong-lanceolate, apiculate; the petals broader, elliptic-oblong, acute; lip broadly obcordate, obscurely three-lobed, light rose streaked with rose-purple and with a white margin; crest consisting of 7—9 radiating pale yellow lines, of which the three central ones are the most prominent and most brightly coloured. Column wings narrow, prolonged upwards.

Miltonia Regnelli, Rchb. in Linnæa, XXII. p. 851 (1848). Id. Xen. Orch. I. p. 133, t. 47, icon. xyl. Lindl. Fol. Orch. Milt. No. 5 (1853). *Bot. Mag.* t. 5436. De Puydt, *Les Orch.* t. 26. Godefroy's *Orchidophile*, 1889, p. 113 (purpurea ?). M. cereola, *Illus. hort. XII.* t. 446 (1865). Oncidium Regnelli, Rchb. in Walp. Ann. VI. p. 760 (1863).

sub-vars.—*purpurea* (*Fl. Mag.* 1870, t. 490. Williams' *Orch. Alb. II.* t. 72), sepals and petals light rose-purple margined with white, lip rich magenta-purple with darker veins and reticulations, lines of the crest white, except the middle one which is bright yellow.

A beautiful species discovered by Dr. Regnell in 1846 in the Brazilian province of Minas Geraes (it is said), but not introduced into European gardens till some years afterwards, its first appearance being at a horticultural exhibition held at Hamburgh in September, 1855; the plant had been brought from Santa Catherina in Brazil.* The species had, however, been previously detected in the same province by Devos, the discoverer and introducer of *Lœlia purpurata*, but who failed to send living plants to Europe on account of the length of time occupied, in those days, in the transmission of plants from Brazil to Belgium. A few years after its first appearance in Hamburgh it was communicated by Gautier to M. Verschaffelt, of Ghent, in whose nursery it flowered in 1865, when it was figured in the *Illustration horticole* under the name of *Miltonia cereola.* The sub-variety, a very striking one, was introduced in 1869.

Miltonia Regnelli comes nearer to the Colombian Miltonias than any of the Brazilian species, a circumstance the more remarkable as it is geographically the most remote.

M. Roezlii.

Pseudo-bulbs ovate-oblong, compressed, 2—2½ inches long, pale green, monophyllous. Leaves linear, acute, 9—12 inches long, pale green. Scapes shorter than or as long as the leaves, rather slender, 2—5 flowered. Bracts subulate-lanceolate, shorter than the pedicels. Flowers quite flat, 3½—4 inches across, white with a purple blotch at the base of each petal, and an orange-yellow disk at the base of the lip; sepals obovate-oblong, acute; petals similar but broader; lip broadly obcordate with an angular sinus in the anterior margin, a small horn-like auricle on each side of the base, and three raised lines on the disk with two small teeth in front of them. Column wings obsolete.

Miltonia Roezlii, Nicholson, Dict. Gard. II. p. 369 (1886). *Rev. de l'Hort. Belg.* 1891, p. 132. Odontoglossum Roezlii, Rchb. in Gard. Chron. 1873, p. 1303, with fig. Id. Xen. Orch. II. p. 191, t. 182, fig. 1. *Bot. Mag.* t. 6085. *Batem. Monogr. of Odont.* t. 30. *Fl. Mag.* N.S. t. 90. *The Garden, X.* (1876), t. 31. Williams' *Orch. Alb. II.* t. 64. Sander's *Reichenbachia, II.* t. 69. Godefroy's *Orchidophile*, 1886, p. 27, icon. xyl.

sub-vars.—*alba* (*Fl. Mag.* N.S. t. 164), flowers wholly white except the yellow disk of the lip, which is paler than in the type; *Warnham Court*, flowers large, the purple blotch on the petals larger and shaded with maroon.

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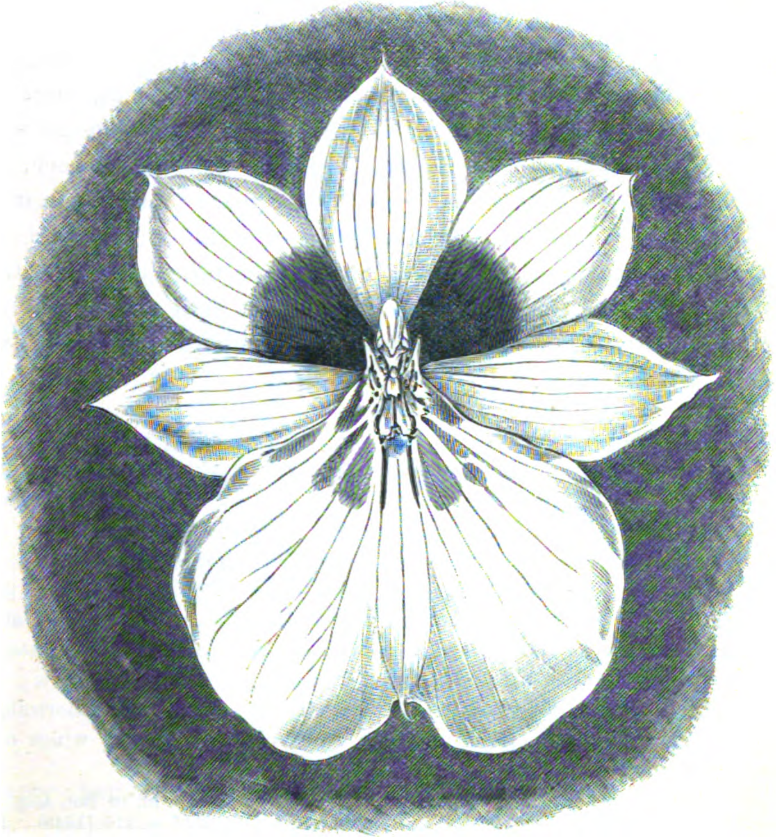
* *Fide* Rchb. in Xen. Orch. I. p. 134.

The following particulars relating to the first discovery of this beautiful plant were communicated to M. Godefroy, of Argenteuil, by the late Benedict Roezl:—

> "Towards the end of March, 1873, I was going down the little river Dagua which flows into the Pacific Ocean. Like all the streams which flow into the ocean from the western Cordillera of New Granada, the current is rapid. I had reached to about ten miles from the outlet when my attention was arrested by the trunk of a tree that was being borne along down the stream upon which was an orchid, quite unknown to me, in full bloom. I immediately requested my negro to secure the treasure, a matter of considerable difficulty owing to the strength of the current. He at length succeeded in detaching the plants, three in number, from the log, and which proved to be a new species of Miltonia (Odontoglossum), allied to *Miltonia vexillaria* and *M. Phalænopsis.*



Miltonia Roezlii alba.

Some months later, the plant (*sic*), with other novelties, was acquired by Mr. William Bull, of Chelsea, for 250 francs."*

Such in substance is Roezl's own account of the discovery of this plant that deservedly bears his name, of which it may be remarked that the locality given is not found on any map to which we have had access, and that the plants in cultivation have, with the above exception, been brought from the valley of the Cauca, on the eastern or opposite side of the western Cordillera.

Chesterton was the next collector to detect it; he brought some cases of plants in good condition to our nursery in 1877, but, *more suo*, did not divulge the true locality in which they had been gathered. He was closely followed by Roezl's nephew, Francis Klaboch, who sent some plants to Europe in the following year; since then it has been frequently imported. Its habitat is now known to be in the province of Antioquia, on the slopes of the hills near the river Atrato, a tributary of the Cauca, growing on trees and rocks mostly in shade at 1,000—2,000 feet elevation, sometimes associated with *Oncidium Kramerianum.*

M. Russelliana.

Pseudo-bulbs ovate-oblong, compressed, 2—3 inches long, diphyllous. Leaves narrowly lanceolate, 6—9 inches long. Scapes 15—24 inches long, green mottled with dull purple,; bracts sheathing, acute, pale brown, ½ inch long, the floral ones shorter. Racemes 5—9 flowered; flowers 2—2½ inches in diameter when spread out; sepals and petals similar, oblong-lanceolate, acute, reddish brown tipped with pale yellow; lip cuneate-oblong, retuse, apiculate, the lateral margins sub-sinuate, the basal two-thirds rose-lilac, the apical third white or light yellow; disk with three raised lines, of which the middle one is the shortest, the lateral two dilated in front into two erect plates. Column wings ovate, acute, yellow.

Miltonia Russelliana, Lindl. Sert. Orch. sub. t. 48 (1840). Id. in Bot. Reg. 1845, sub. t. 8. Id. Fol. Orch. Milt. No. 4. Paxt. *Mag. Bot. VII.* p. 217 (1840). Rchb. Xen. Orch. I. p. 131. Oncidium Russellianum, Lindl. in *Bot. Reg.* t. 1830 (1836). Rchb. in Walp. Ann. VI. p. 761 (1863). Kegel's *Gartenfl.* 1880, t. 1012 (pallidum).

Introduced to the Woburn collection in 1835 from Rio de Janeiro, and named in compliment to the Duke of Bedford. The only habitat we find recorded is Tejuco, in the province of Rio de Janeiro. Our description is from a plant that was in the Downside collection, since dispersed; it is one of the least attractive of the Miltonias, not now often seen.

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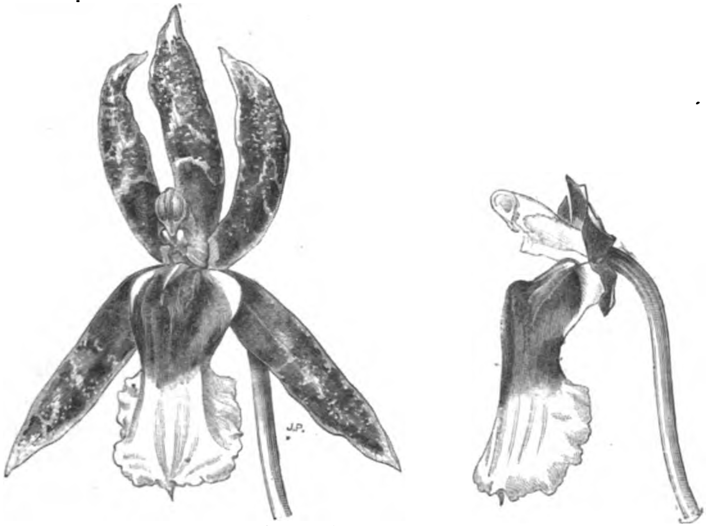
* *Orchidophile*, 1883, p. 476.

M. Schroederiana.

Pseudo-bulbs ovoid-oblong, 1½—2 inches long, diphyllous. Leaves linear-oblong, acute, 5—7 inches long. Scapes erect, longer than the leaves, racemed above, 7—9 flowered; bracts small, acute, glumaceous. Flowers fragrant, 2½ inches across vertically; sepals and petals with revolute margins, linear-oblong, acute, chestnut-brown tipped and marked with light yellow; the sepals keeled behind, the lateral two divergent and a little longer than the dorsal one, the petals falcately turned towards the dorsal sepal; lip sub-pandurate, the basal half nearly oblong, rose-purple, the apical half sub-quadrate, apiculate, convex above, milk-white; crest consisting of three protuberances with a shallow raised line on each side of them. Column white above, yellow in front, the wings very narrow.

Miltonia Schroederiana, supra. Odontoglossum Schroederiana, Rchb. in Gard. Chron. I. s. 3 (1887), p. 364. Williams' *Orch. Alb. VIII.* t. 382. Sander's *Reichenbachia, II.* t. 96.



Miltonia Schroederiana.

A very handsome species imported from Central America by Messrs. Sander and Co. some time prior to 1885, in January of which year a plant was exhibited by Baron Schroeder at the Royal Horticultural Society's meeting; it is still very rare in British gardens. We are indebted to Baron Schroeder for materials for figuring and description.*

*** The plant described by Reichenbach in the *Gardeners' Chronicle* of 1882, Vol. XVII., p. 700, under the name of *Odontoglossum Schroederianum*, and which is also in Baron Schroeder's collection at The Dell, is a true Odontoglot, and quite distinct from that described under the same name in the *Gardeners' Chronicle* of 1887, vol. I. s. 3, p. 364, which is the Miltonia figured and described above. Both in Williams' *Orchid Album*, IX. sub. t. 382, and Sander's *Reichenbachia*, II. sub. t. 96, the two are confused together.**

M. spectabilis.

Rhizome stoutish, creeping, scaly, as thick as a goose-quill. Pseudo-bulbs produced from the rhizome at short intervals, ovate-oblong, compressed, 3—4 inches long, diphyllous. Leaves linear-ligulate, 4—6 inches long, both pseudo-bulbs and leaves usually of an ochreous yellow hue. Scapes as long as the pseudo-bulbs and leaves, sheathed by alternate, imbricating ancipitous bracts, and a larger one embracing the ovary, one flowered. Flowers nearly flat, 3 inches in diameter; sepals and petals lanceolate-oblong, acute, the petals a little the broadest, white or cream colour, sometimes tinged with rose towards the base; lip large, spreading, obovate-orbicular, vinous purple with 6—8 longitudinal veins of a deeper shade, the margin white or pale rose; crest tri-lamellate, the lamellæ terminating in small erect plates, usually yellow. Column wings sub-triangular, rose-purple.

Miltonia spectabilis, Lindl. in Bot. Reg. sub. t. 1976 (1837). *Id.* t. 1992. Id. 1845, sub. t. 8. Id. Fol. Orch. Milt. No. 1. *Bot. Mag.* t. 4206. Paxt. *Mag. Bot. VII.* p. 97. Rchb. Xen. Orch. I. p. 129. *Illus. hort. VI.* t. 216. *The Garden, XXXI.* (1887), t. 593. Macrochilus Fryanus, Knowles and Westc. *Fl. Cab. II.* t. 45 (1837). Oncidium spectabile, Rchb. in Walp. Ann. VII. p. 759 (1863).

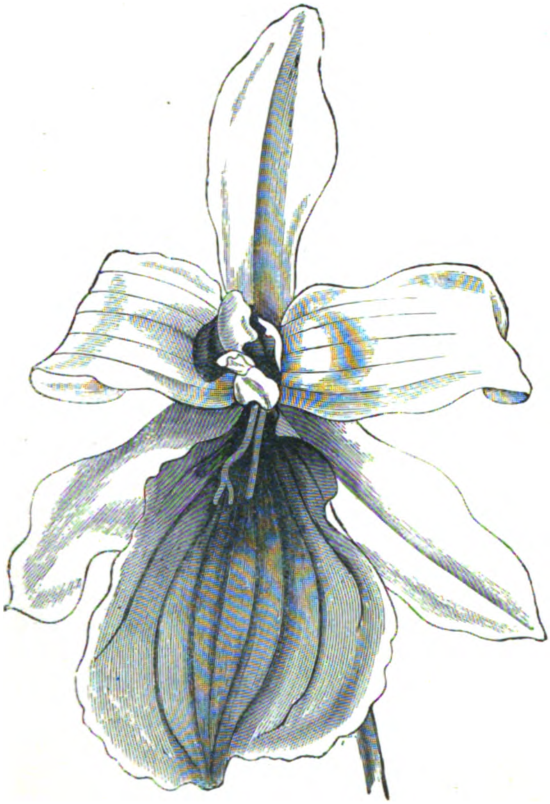
var.—Moreliana.

Flowers usually larger than the type and very distinct in colour; sepals and petals plum-purple; lip bright rose-purple with deeper veins and reticulations.

M. spectabilis Moreliana, Henfrey's Gard. Mag. Bot. III. p. 41, with fig. Van Houtte's *Fl. des Serres, X.* t. 1008. De Puydt, *Les Orch.* t. 27. *Lindenia, III.* t. 105. Williams' *Orch. Alb. VIII.* t. 364. M. Moreliana, Warner's *Sel. Orch. I.* t. 32. *Fl. Mag.* N.S. *III.* t. 143. Jennings' *Orch.* t. 37. M. spectabilis purpureo-violacea, *Bot. Mag.* t. 4425.

sub.-vars. (distinguished by colour only).—*bicolor*, flowers white with a large plum-purple blotch at the base of the lip; *lineata* (*Lindenia, II.* t. 62), lip with 7—9 purple lines radiating from a blotch of the same colour at the base to the margin; *radians* (Rchb. Xen. Orch. I. p. 130. Williams' *Orch. Alb. IV.* t. 164), flowers white with six club-shaped purple rays on the disk of the lip; *rosea* (*Illus. hort.* 1867, t. 524), flowers light rose with purple longitudinal lines on the lip; *virginalis* (*Illus. hort.* 1869, t. 573), flowers white with a broad wedge-shaped purple blotch at the base of the lip.

Miltonia spectabilis, as already stated, is the species on which the genus was founded and, with the exception of *M. flavescens,* which previous to the introduction of *M. spectabilis* had been referred to Cyrtochilum and *M. Russellianum,* which had been figured and described as an Oncidium, it is one that has been longest known to science and to horticulture, and yet up to the present time its precise habitat is known only to the orchid collectors at Rio de Janeiro. Lindley indeed states that it was gathered by Weddell on the Serra de Estrada, but no such locality is to be found on any modern map of Brazil within our reach. Thus in the case of three of the longest known and finest of the Brazilian Miltonias, *spectabilis*, *candida*, and *cuneata*, the dates of their discovery, the names of their discoverers, and their precise habitats are virtually unknown.



Miltonia spectabilis.

The subject of our present notice was originally sent to the Birmingham Botanical and Horticultural Society from Brazil, in 1835, by a Mr. Fry, and was dedicated to that gentleman by Knowles and Westcott in their *Floral Cabinet* under the name of *Macrochilus Fryanus*, but as this name was published one month later than Dr. Lindley's *Miltonia spectabilis* in the *Botanical Register*, it cannot be accepted. It flowered for the first time in this country in Messrs. Loddiges' nursery at Hackney in 1837, and a little later in the same year in Mr. George Barker's collection at Birmingham. It has been frequently imported since, and among these importations have appeared from time to time the various forms described above. The variety *Moreliana* is one of the most remarkable colour deviations from the typical form to be found among orchids;* it was sent to M. Morel, of St. Mandé, near Paris, in 1846, by his Brazilian correspondent, M. Porte, and was shortly afterwards cultivated by Messrs. Knight and Perry, our predecessors at the Royal Exotic Nursery. All the sub-varieties noted above are decidedly handsome, and most of them well-marked horticultural forms.

The estimation in which *Miltonia spectabilis* is held, has found expression in the unusual number of coloured plates of it and its varieties that have appeared in the horticultural periodicals at intervals from the date of its first flowering in this country down to the present time.

M. vexillaria.

Leaves linear-lanceolate, acute, keeled beneath, imbricate at base, distichous and alternate, usually 6—8 to one growth, the lower two shorter than those above, and the upper two partially enclosing at their base a flattened oval-oblong pseudo-bulb 1½—2½ inches long, which is monophyllous at the apex, the whole plant of a glaucous pea-green colour. Scapes usually two from each pseudo-bulb, but sometimes three or more, slender, arching, 12—20 inches long, racemed, 4—7 flowered. Flowers variable in size and colour, 3—4 inches across vertically, usually light rose-colour, but often varying from rose-carmine to almost white or white flushed with light rose; sepals and petals similar and sub-equal, obovate-oblong; lip flat, sub-orbicular, two-lobed in front, and with a small ovate ascending auricle on each side at the base; crest yellow, two-lobed at base, prolonged in front into three short teeth. Column wings obsolete.

Miltonia vexillaria, Benth. in Journ. Linn. Soc. XVIII. p. 327 (1881). Benth. et Hook. Gen. Plant, III. p. 563 (1883). Nicholson, Dict. Gard. II. p. 369, with fig. Sander's *Reichenbachia, I.* s. 2, t. 29. Odontoglossum vexillarium, Rchb. in Gard. Chron. 1867, p. 901; 1872, p. 667; 1873, pp. 580 and 644 with figs. Id. *Xen. Orch. II.* p. 190, t. 182. *Bot. Mag.* t. 6037. *Fl. Mag.* N.S. t. 73. Batem. *Monogr. Odont.* t. 29. Jennings' *Orch.* t. 36. *Illus. hort. XX.* t. 113. *Revue hort.* 1876, p. 390. Warner's *Sel. Orch. II.* t. 38. *Belg. hort. XXX.* p. 257. Van Houtte's *Fl. des Serres, XX.* t. 2058.

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* The reader will here doubtless call to mind the equally remarkable variety of *Vanda Parishii* called *Marriottiana.*

var.—Leopoldii.

Sepals and petals recurved beyond the middle, rose suffused with white; lip concave, of a deeper rose than the other segments, and with a deep blood-red blotch at the base, of triangular shape, having a broad cusp at the apex and two short lateral rays.

M. vexillaria Leopoldii, Hort. et supra.

var.—rubella.

Flowers smaller than in the original type and appearing later in the year, rose-pink, the sepals and petals bordered with white, the lip with a large white space in front of the yellow disk.

M. vexillaria rubella, supra. Odontoglossum vexillarium rubellum, Hort. Od. vexillarium Klabochianum, Hort.

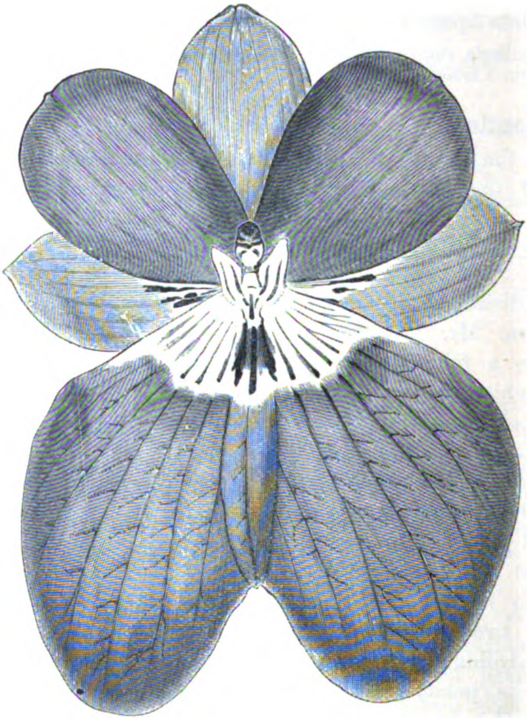
var.—stupenda.

Flowers the largest of the species yet seen, vertical diameter 5 inches, breadth of the labellum 3½—4 inches; colour light rose suffused with white.

M. vexillaria stupenda, supra.

sub-vars. (distinguished by colour only).—*alba* (Williams' *Orch. Alb. V.* t. 227, syn. Mr. Measures' var. syn. Fairy Queen), pure white, sometimes with a faint roseate tinge at the base of the sepals and petals; *albicans*, white with a few red streaks in front of the pale yellow disk of the labellum; *Herr Lehmann's* (Gard. Chron. XIII. (1880), p. 586), sepals and petals rose, the lateral sepals with three dark stripes, the white area of the labellum also striped; *leucoglossum* (Gard. Chron. XIV. (1880), p. 296), sepals and petals light rose, lip white; *Mr. Cobb's*, sepals and petals light rose passing into white at the margin, lip white with three small orange-yellow lines, at the base of which the middle one is the longest; *Mr. Hill's* (Gard. Chron. XIV. (1880), p. 296), rose with two purple lines on the lateral sepals and three at the base of the labellum, which is dotted with purple; *Mrs. H. Ballantine*, sepals white, petals with the central area rose-pink, lip rose-pink with a narrow white margin and with a white transverse band in front of the yellow disk; *M. Wiot's* (Gard. Chron. XVII. (1882), p. 826), white with two short purple lines on the lateral sepals and three in front of the yellow disk of the labellum; *rosea* (Williams' *Orch. Alb. VIII.* t. 348), bright rose with a narrow white zone in front of the yellow disk of the labellum; *rubra* (*Fl. Mag.* N.S. t. 461), deep rose, the lip with darker veins and with three divergent blood-red streaks in front of the yellow disk; *Sander's* (Gard. Chron. X. s. 3 (1891), p. 394), sepals white flushed with light rose, the lateral two with dotted crimson lines near the base, petals light rose, lip with a sanguineous triangular blotch with several thick lines radiating from it; *superba* (Gard. Chron. XVI. (1881), p. 364. Williams' *Orch. Alb. IV.* t. 171. *Lindenia V.* t. 201, syn. *Lawrenceana.* Gard. Chron. XXII. (1884), p. 396), rose-pink, the lateral sepals with 1—2 red-purple streaks near the base, the lip with a large triangular rayed blotch at the base, of maroon-purple toned with red and bordered with a zone of the purest white.

This popular and charming Miltonia is supposed to have been originally discovered by Bowman, while collecting plants in New Granada in 1866—67, and where he shortly afterwards succumbed to the climate and fatigue. This belief is strengthened by the following passage that occurs in his letter of October 14th, 1867, to the late Mr. James Veitch, giving an account of his journey across New Granada from Buenaventura to Bogota:—"Another good plant is the scarlet Odontoglossum; this is the brightest I have yet seen among orchidaceous plants." From the route taken, it is probable that he met with the plant, assuming that the extract refers to *Miltonia vexillaria,* in some locality on the western slopes of the coast Cordillera, but where it is comparatively rare. It first became



Miltonia vexillaria.

known in a tangible form through a dried flower brought to a British horticultural firm under circumstances amusingly related by Reichenbach in his first announcement of the species,* but which was not followed by its immediate introduction. In the meantime it had been re-discovered by Wallis while collecting plants in New Granada for M. Linden, but he too failed to introduce it into European gardens. Disappointment also attended Roezl, who was commissioned in 1871 by M. Linden to collect it in the locality in which it had been found by Wallis, but from the delay and difficulty of transmission the plants were all dead when they reached Belgium. Enough, however, had by that time transpired to excite a most lively interest in the plant, and an ardent desire to see it blooming in the plant houses of Europe. With the slenderest scrap of information then available, Chesterton, early in the year 1872, undertook at our request to endeavour to seek it out and to bring a consignment home. That he succeeded in bringing it to England, and its flowering for the first time in our houses in the spring of 1873, are well-known facts in its history. The interest awakened by its actual presence in our midst and the general admiration accorded to it soon caused it to become a favourite with amateurs of orchids.

The veil of mystery that so long shrouded this lovely plant during its early history has since been torn away, and we are now in possession of ample details respecting its habitat and the conditions under which it grows in its native home. For this valuable information, science and horticulture are in a great measure indebted to one of the ablest observers of orchid life in the Andean region who has ever lived and travelled in it, Herr F. C. Lehmann, the German Consul in that country, from whose communication to the Berlin *Gartenflora*† we extract the following details:—

> The southern limit of *Miltonia vexillaria* is on the western slopes of the snow-capped "Huarmi-Urcu," and the volcano of Coatacachi, in the provinces of Esmeralda and Imbabura, in northern Ecuador; here and on the western slopes of the volcanic peaks of Chiles, Cumbal, and Mallama, in southern Colombia, occur the varieties *Lehmanni*, *albicans*, and *Measuresiana* (*alba* supra). The species thence spreads northwards along the central mountain region and the western slopes of the West

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* Gard. Chron. 1867, p. 901.

† Jahrgang 38 (1889), p. 350.

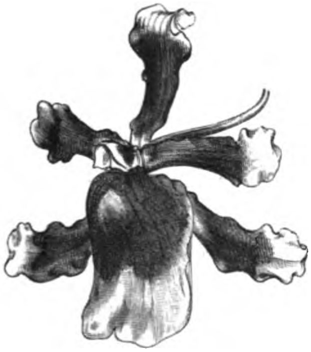
Cordillera, as far as the sources of the rivers Sinu and San Jorje, in the province of Antioquia, in North Colombia. Over this region it occurs in greater or less quantity in isolated patches. Among the best-known stations are the central Cordillera, between Frontino and Sonson, on the Tavallones de Cali, the undulated plateau of Popayan, and the western slopes of the volcanos of northern Ecuador. The whole region in which *Miltonia vexillaria* grows is well defined and similarly bounded. With one exception, the variety *albicans* which occurs at 4,000—4,500 feet elevation on the river Cuaiquer, the lower and higher limits of *Miltonia vexillaria* are almost everywhere about 4,750 and 6,500 feet above sea-level. The average mean temperature of the year between these limits fluctuates between 16·5°—19·5° C. (62°—67° F.), that of the variety *albicans* 20°—21° C. (68°—70° F.); the extreme daily range when the mornings are clear and the days bright is from 12° C. (53° F.) minimum, to 25° C. (77° F.) maximum. Generally speaking, *Miltonia vexillaria* is found isolated in places influenced by local climatic conditions, being most abundant at its medium altitude; it always occurs on the borders of the denser mountain forests which have below them either open or park-like stretches covered with low bushes or coarse savannah grass, and above, the extremely humid and almost impenetrable and luxuriant forests that cover the Cordilleras at that altitude. The characteristic hygrometric peculiarity of the whole region over which *Miltonia vexillaria* is spread is, that it is constant nearly throughout the year; even in what is called the dry season the air is only relatively less humid. The daily changes in the weather may be thus summarised:—During the dry season the day breaks clear, but soon after sunrise a thick mist settles over the forest till about 10 a.m.; it then ascends higher, and the rays of the sun begin with difficulty to penetrate it; the air is then filled with a bluish mist that shuts out the distant view. A light shower of rain falls in the afternoon about 2 o'clock, which often continues till evening, when it gives place to a thick mist. During the rains there is generally a light wind blowing towards the mountains from the lower river valleys. In the rainy season the circumstances are nearly the same, except that the rain is more copious, the drops heavier, and the showers of longer duration. At times the rain is continuous for several days in succession; the atmosphere is then at the saturation point.

Of the varieties described above scarcely anything has been divulged respecting their origin. Herr Lehmann, indeed, states that *rubella* is a geographical form first gathered by Wallis in 1876, and subsequently by himself, but gives no locality; *Leopoldi* and *stupenda* are both very distinct forms whose origin is unknown to us. The colour variations or sub-varieties are innumerable, often gliding into each other by insensible gradations so that it is almost futile to designate them by name; those designated above are fairly distinct and may without difficulty be identified. This variability in colour is, however, one of the greatest excellencies of the species in a horticultural sense, and the large groups of *Miltonia vexillaria* now to be seen in many of the orchid collections in this country afford in their flowering season, May and June, one of the most attractive floral sights that can be produced from among the ORCHIDEÆ.*

M. Warscewiczii.

Pseudo-bulbs oblong, compressed, 4—5 inches long, 1 inch broad, monophyllous. Leaves linear-oblong obtuse, 5—7 inches long. Scapes exceeding in length the pseudo-bulbs and leaves, usually panicled but sometimes racemed, many-flowered; bracts acuminate, shorter than the ovary. Flowers somewhat crowded, 2 inches across vertically; sepals and petals similar and sub-equal, oblong-spathulate, undulate, brownish red, sometimes yellow, sometimes white at the tip; lip broadly oblong with a medium cleft in the anterior margin, rose-purple with a red-brown disk and white margin, white at the very base where there are two small yellow teeth. Column wings rounded, red-purple.

Miltonia Warscewiczii, Rchb. Xen. Orch. I. p. 132 (1855). Id. in Gard. Chron. 1867, p. 277; V. (1876), p. 394; VII. (1877), p. 202. *Bot. Mag.* t. 5843. Williams' *Orch. Alb. V.* t. 216. Oncidium fuscatum, Rchb. in Walp. Ann. VI. p. 763 (1863). Van Houtte's *Fl. des Serres, XVIII.* t. 1831. *Illus. hort. XXI.* t. 156. Odontoglossum Weltonii, Hort.



Miltonia Warscewiczii.

A very handsome species originally discovered by the German botanist, Pœppig, who detected it in 1830 on the Peruvian Andes, near Cuchiro.* It was next found by the Polish traveller and collector, Warscewicz, who brought to Europe dried specimens from which the plant was first described, and the species was accordingly dedicated to him. It was introduced to European gardens by Linden in 1868, through Wallis, probably from New Granada, in which country it had been detected by Purdie many years previously. Quite recently it was found by our collector, Burke, growing on small trees and shrubs close to the ground and on moss-covered stones at 2,000—3,000 feet elevation, near the Rio Verde, in the province of Antioquia. A plant exhibited at a meeting of the Royal Horticultural Society in October, 1869, was probably the first that flowered in this country. *Miltonia Warscewiczii* is the only species in the genus yet known with a panicled inflorescence, the flowers of which vary considerably in colour in different plants.

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* The enormous inroads constantly being made upon *Miltonia vexillaria* by orchid collectors in New Granada would seem to threaten its extinction were it not that the extensive geographical area over which it is dispersed affords an assurance that it exists in quantity too large to be sensibly diminished by that means, except in particular localities, for a long time to come. Moreover, the reproductive power of the plant is so great as to secure its perpetuation against adverse influences. Herr Lehmann estimates that about 75 per cent. of the flowers produce capsules in a wild state with germinating seeds; the seeds easily and quickly germinate, but many of the young plants perish.

HYBRID MILTONIAS.

Supposed Natural Hybrids.

Two Miltonias of supposed hybrid origin have appeared among the importations of the Brazilian species. The hypothesis of this origin rests upon the presence of characters in the floral and, in a less degree, in the vegetative organs of the offspring that are evidently blendings of the characters of the corresponding organs of the presumed parents in the manner described below.

Miltonia Bluntii.

Pseudo-bulbs from a creeping rhizome as in *Miltonia spectabilis*, and bearing two apical leaves of larger size than usually seen in that species Scapes sheathed by ovate-lanceolate bracts and terminating in a few-flowered raceme. Flowers nearly as large as those of *M. spectabilis;* sepals and petals stellate, whitish yellow with some red-brown blotches in the central area, the sepals lanceolate, the petals broader and less acute; lip obcordate with the side margins depressed, the apical part much undulated and white, the basal part purplish crimson as in *M. Clowesii.*

Miltonia Bluntii, Rchb. in Gard. Chron. XII. (1879), p. 489.

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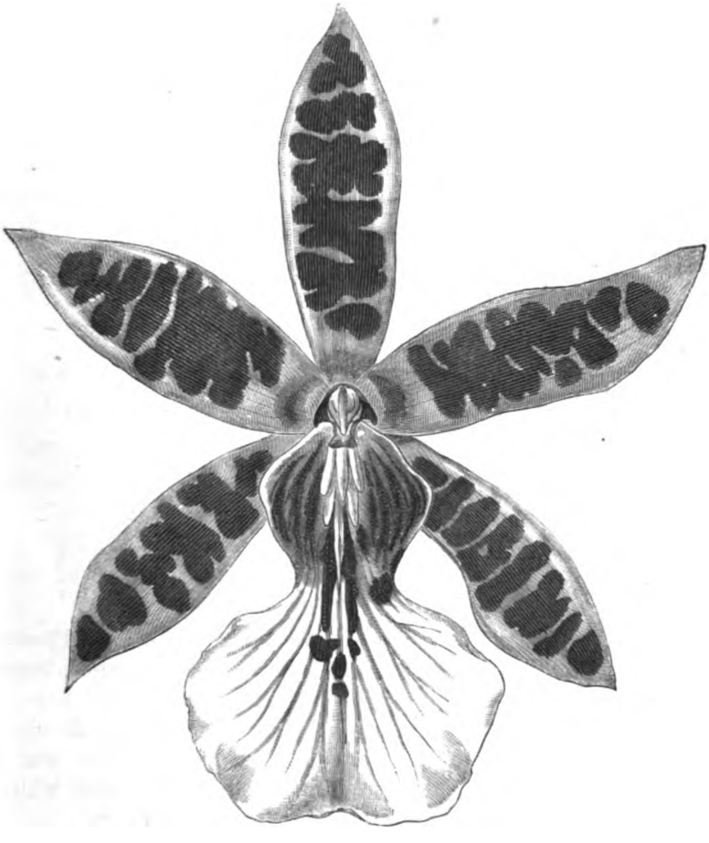
* We give this on the authority of the late Professor Reichenbach (Xen. Orch. I. p. 132), whose evidence was an imperfect specimen in Pœppig's herbarium. "Eamdem speciem seu valde affinem, jam diu novimus ex herbario Poppigiano sed statu deplorabili."

var.—Lubbersiana.

Flowers larger than the original form, about 4 inches across vertically; sepals and petals light yellow with broad close-set purplish brown bars and blotches, and with a purple stain at the base; the basal area of the lip purple with several red-brown lines, the apical area much lighter.

M. Bluntii Lubbersiana, Rchb. in Gard. Chron. II. s. 3 (1887), p. 649. Godefroy's *Orchidophile*, 1890, p. 176.



Miltonia Bluntii, var. Lubbersiana.

A supposed natural hybrid between *Miltonia spectabilis* and *M. Clowesii*, in which the first named greatly preponderates in the vegetative organs and the latter in the colour of the flowers, the segments of which are intermediate between the two. The original form was sent to Mr. Richard Bullen, of the Woodlands Nursery, Lewisham, from Rio de Janeiro, in 1879, by Blunt, formerly orchid collector for Messrs. Low and Co. The variety, which is among the handsomest of

Miltonias, appeared in 1887 in the nursery of M. Peeters at St. Gilles, Brussels, and is named in compliment to M. Lubbers, Curator of the Botanic Garden of that city.

M. festiva.

Rhizome, pseudo-bulbs and leaves as in *Miltonia spectabilis.* The 2—3 flowered peduncles sheathed with ancipitous bracts as in that species, but shorter; sepals and petals nearly as in *M. flavescens,* light yellow; lip more that of *M. spectabilis,* but with an acute apex, light purple.

Miltonia festiva, Rchb. in Gard. Chron. 1868, p. 572.

A supposed natural hybrid between *Miltonia spectabilis* and *M. flavescens.* It was sent for identification to Professor Reichenbach in 1865 by M. Lüddemann, of Paris; a few years later it appeared in Messrs. Low's nursery at Clapton, and in 1877 a plant flowered in our Chelsea nursery. Since that date we find no evidence of its being in cultivation.

GARDEN HYBRIDS.

The only hybrid Miltonia raised artificially that has yet flowered is that here described, and which has been obtained by two operators from the crossing of the same pair of species, first by M. Bleu, of Paris, Secrétaire Général de la Societé nationale de l'Horticulture de France, and secondly by ourselves.

Miltonia Bleuana.

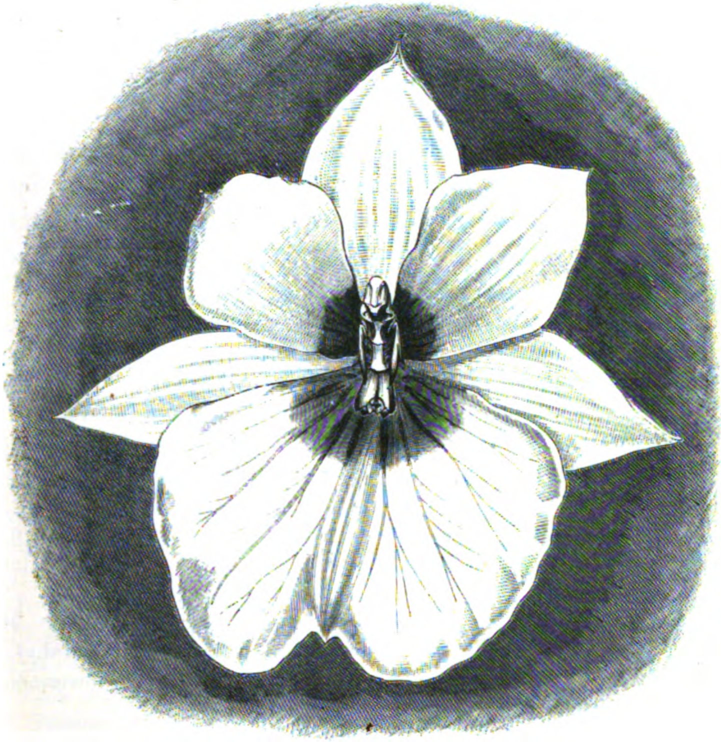
M. vexillaria × *M. Roezlii.*

Vegetative organs nearly as in *Miltonia vexillaria.* Flowers 3—4 inches across vertically; sepals and petals intermediate, the former wholly white, the latter white with a rose-purple stain at the base; lip also intermediate, having the broader obcordate form of *M. Roezlii* and the apical sinus but not so deep, of *M. vexillaria,* white with a fan-shaped rayed red-brown blotch in front of the yellow disk which is also intermediate in shape between that of the two parents.

Miltonia Bleuana, Gard. Chron. V. s. 3 (1889), p. 208. *Lindenia, IV.* t. 176. Sander's *Reichenbachia, I.* s. 2, t. 32. Williams' *Orch. Alb. IX.* t. 412 (splendens). M. Bleui, Godefroy's Orchidophile, 1889, p. 45. Id. Miltonopsis Bleui, p. 145, with fig.

sub-var.—*aurea* (*Orchidophile,* 1889, p. 145, with fig.), flowers white with a faint flush of light rose at the base of the petals, and with the yellow disk at the base of the lip somewhat enlarged.

The seeds obtained by M. Bleu from his cross were sown in April, 1884, and the first flower expanded early in January, 1889. Seden's cross was effected a little later; the seeds were not sown till January, 1885, and the first flower of the progeny did not expand till the Spring of 1891. In the clearer atmosphere and warmer climate of Paris M. Bleu succeeded in raising more seedlings in a shorter time than we did, and they also showed some differences in colour, *inter se*, among which that noted above is sufficiently distinct to have a name for garden use.



Miltonia Bleuana.
(From the Chelsea cross.)

BRASSIA.

R. Br. in Ait. Hort. Kew. ed. 2, V. p. 215 (1813). Lindl. Gen. et Sp. Orch. p. 212 (1833). Benth. et Hook. Gen. Plant. III. p. 564 (1883).

The Brassias occupy but a subordinate place, in a horticultural sense, in the group of genera to which they are nearest allied. This is owing to the absence generally of the bright colours and varied tints which render so many of their congeners among the Oncidiums and Miltonias so highly appreciated by the cultivators of orchids. But although the flowers of most of the Brassias are of a homely and inattractive hue, there are not wanting forms in which strong colour contrasts are present, as in *Brassia Antherotes* and *B. Keiliana tristis;* and in most of the cultivated species the flowers are more or less pleasantly fragrant.

The botanical relationship between Brassia and Miltonia has been already stated.* Its affinity to Oncidium is also very close, from which, as Lindley long since pointed out, "there is nothing in reality that separates it except its very short earless column and entire bilamellate lip *combined* with elongated lateral sepals." † Nevertheless, there is a distinctness in the inflorescence by which the species can be recognised as Brassias at a glance, and which affords characters sufficiently definite to admit of the genus being retained. These characters may be expressed thus—

> The *scapes* are always racemed and of a definite length, comparable with that of the leaves; the bracts are short and inconspicuous in all the cultivated species, except in *Brassia Keiliana.*
>
> The *sepals* are long, linear, acuminate, and often tail-like.
>
> The *petals* are similar, but shorter and narrower, and are placed either at a small angle to the dorsal sepal or turned towards it in a falcate manner.
>
> The *lip* is sessile at the base of the short wingless column, entire, usually flat, bilamellate at the base, and about the same length as the petals.
>
> The *vegetative organs* of the Brassias conform nearly to the Miltonias and to many of the Oncidiums; the pseudo-bulbs are mono-diphyllous, the leaves below them in the new growths are few, the lowermost being reduced to scales.

The genus was founded by Dr. Robert Brown on *Brassia maculata,* and named in commemoration of Mr. Brass, a skilled botanical draughtsman who collected seeds, plants, and dried specimens on the Guinea coast and in South Africa for Sir Joseph Banks and others in the early part of the present century. Upwards of twenty species have been published, some of which are but little known, and in others more definite characters are wanting by which they may be technically distinguished from each other.‡ They are all natives of tropical America, of which the greater number are dispersed over the West Indian Islands and the adjacent parts of Guiana, Venezuela, and New Granada; three or four are reported from Guatemala and Costa Rica, two from the Peruvian Andes, and one is vaguely stated to be a native of Brazil.

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* *See* page 95.

† Folia Orch. Brassia, p. 1. In Walp. Ann. VI. p. 765, Reichenbach has brought all the Brassias under Oncidium.

‡ Some of the Brassias hitherto regarded as species approach each other so closely in structural details that they have been surmised to be geographical forms of one widely dispersed type.

Cultural Note.—There is scarcely any group of orchids that has proved more tractable under cultivation than the Brassias. All the introduced species grow freely under the treatment usually given to the warmer Oncids, the routine for potting, watering, shading, &c., being the same. As the Brassias are usually found growing on trees in shade, attention must be given to the shading of the plants especially on bright days in the summer months; the supply of water must be constant, but regulated as to quantity according to the season. The temperature is indicated by the geographical stations of the species; thus the West Indian and Central American kinds may be grown in the East Indian house, but many cultivators prefer an intermediate temperature such as is maintained in the warmest position in the Cattleya house. For those species whose native homes are on the Cordilleras of South America an intermediate temperature is undoubtedly the best.

Brassia Antherotes.

"Racemosa; sepalis caudatis, petalis bene brevioribus, labello oblongo acuminato antrorsum dilatato antice bene acuminato, callo baseos ligulato antice connato basi dilatato ampliato intus puberulo velutino, linea angulata utringue anteposita."—H. G. Reichenbach, fil. in Gard. Chron. XII. (1879), p. 782.

Flowers deep yellow, the sepals and petals blotched with blackish purple, the lip spotted with the same colour in the central part and on each side of the crest.

Brassia Antherotes, Rchb. in Gard. Chron. loc. cit. Williams' *Orch. Alb. IV.* t. 159.

Discovered by the brothers Klaboch on the Andes of Colombia, and probably introduced by them. It was cultivated by the late Provost Russel, of Falkirk, in 1879, which is the earliest notice we find of its flowering in this country. It is one of the richest coloured Brassias known, but still very rare in gardens.

B. brachiata.

Pseudo-bulbs from a stout ligneous rhizome, ovoid-oblong, compressed, 3—5 inches long. Leaves linear-lanceolate, acute, 9—12 inches long. Scapes 2—3 times as long as the leaves, dull purple mottled with pale green, terminating in a 7—10 flowered raceme. Flowers among the largest in the genus; sepals 6 inches long, light yellow-green with 2—3 brown-purple spots near the base; petals about two-thirds as long as the sepals, with 10—15 spots near the base; lip light yellow, the basal half oblong with revolute margins, and spotted with dark green flattened warts; the apical half cordate, acuminate with but few warts; crest bilamellate, elevated at the apex, white spotted with orange.

Brassia brachiata, Lindl. in Benth. Plant. Hartweg, p. 94 (1839). Id. in *Bot. Reg.* 1843, misc. No. 2, and 1847, t. 29. Id. Fol. Orch. Brassia, No. 8. Linden's *Pesc.* t. 31. Oncidium brachiatum, Rchb. in Walp. Ann. VI. p. 768.

One of the discoveries of Hartweg during his mission to Central America for the Horticultural Society of London, 1838—43. He detected it near the Hacienda de la Laguna, in Guatemala, and it was probably introduced through him; it flowered for the first time in this country in Messrs. Rollisson's nursery at Tooting, in 1843. It is very near *Brassia verrucosa,* of which, in fact, it is a gigantic form, but at the same time one of the finest in the genus.

B. caudata.

Pseudo-bulbs oblong, 3—4 inches long and 1 inch broad. Leaves oblong-ligulate, 7—9 inches long. Scapes as long again as the leaves; 7—10 flowered; sepals and petals light greenish yellow with large dark brown spots on the broader basal portion, the dorsal sepal about 3 inches long, the lateral two prolonged into slender tails as long again as the dorsal one; petals about one-third the length of the dorsal sepal; lip oblong with an acuminate tip, light yellow with some red-brown spots in front of the short bilamellate crest, which is white spotted with orange.

Brassia caudata, Lindl. in *Bot. Reg. X.* t. 832 (1824). Id. Gen. et Sp. Orch. p. 212 (1833). Id. Fol. Orch. Brassia, No. 5. *Bot. Mag.* t. 3451 (1835). Epidendrum caudatum, Linn. Sp. pl. p. 1349. Oncidium caudatum, Rchb. in Walp. Ann. VI. p. 766.

This species is botanically interesting as being one of the few epiphytal orchids known to Linnæus, and scarcely less so in a horticultural sense on account of its being one of the first Brassias cultivated in this country. It is a native of Jamaica and probably other West Indian islands, and was introduced by Mr. Lee, of Hammersmith, about the year 1823. The long attenuated tail-like lateral sepals, greatly exceeding in length the dorsal one, distinguishes this species from most of its congeners.

B. Gireoudiana.

Pseudo-bulbs broadly oblong, much compressed, 3—4 inches long, 2—2½ inches broad, mono-diphyllous. Leaves narrowly oblong, acute, 6—12 inches long, leathery, bright green. Scapes as long again as the leaves, 7—10 flowered; sepals yellow-green spotted with brown near the base, the dorsal sepal 3½—4 inches long, the lateral two 4½—5 inches long; petals half as long as the dorsal sepal, the apical half yellow-green, the basal half brown; lip broadly obovate, apiculate, light yellow, the basal and central area spotted with brown, the bilamellate crest orange-yellow.

Brassia Gireoudiana, Rchb. in Allgem. Gartenz. XXII. (1854), p. 273. Id. *Xen. Orch. I.* p. 79, t. 32.* Oncidium Gireoudianum, Rchb. in Walp. Ann. VI. p. 768.

Discovered by Warscewicz in Costa Rica, and introduced by him into Germany. It flowered for the first time in Europe in the garden of Herr Nauen, at Hamburg, after whose gardener, Gireoud, it is named.

B. Keiliana.

Pseudo-bulbs clustered, narrowly ovate, 1½—2 inches long. Leaves lanceolate, acute, 7—10 inches long. Scapes longer than the leaves, many flowered; bracts subulate, acute, nearly as long as the pedicel and ovary; sepals and petals yellow-green spotted with brown on the broader basal portion, the sepals 2½—3 inches long, the petals about half as long; lip triangular-oblong, contracted at the apex into an acuminate tail, whitish with some brown spots in front of the two-keeled crest.

Brassia Keiliana, Rchb. in Paxt. Fl. Gard. 1852, p. 114. Id. in Bot. Zeit. 1852, p. 761. Id. *Xen. Orch. I.* p. 126, t. 45 (three forms). Regel's *Gartenfl.* 1862, t. 365. Lindl. Fol. Orch. Brassia, No. 16. Oncidium Keilianum, Rchb. in Walp. Ann. VI. p. 770.

var.—tristis.

Sepals and petals dark sepia-brown; lip with the apical tail longer and springing more abruptly from the light yellow blade.

B. Keiliana tristis, Rchb. *Xen. Orch. I.* p. 126, t. 45, fig. 3. Williams' *Orch. Alb. VIII.* t. 347.

Native of the Cordilleras of northern Colombia and Venezuela, at 5,000—7,000 feet elevation. It was first discovered by Wagener in the province of Caracas, and introduced by him into Germany about the year 1852; it is dedicated to Hofrath Keil, of Leipsig.

The species is a variable one, especially as regards the colour of its flowers; the variety *tristis* is a very remarkable one in this respect.

B. Lanceana.

Pseudo-bulbs ovate-oblong, 3—5 inches long, much compressed, ribbed and furrowed on the flattened sides, diphyllous. Leaves oblong or oblanceolate, acute, 9—12 inches long. Scapes as long as or longer than the leaves, 7—10 or more flowered. Sepals and petals light yellow spotted with brown on the basal half, the sepals 2½—3 inches long, the petals half as long; lip oblong, acute, undulate, cream-white with a few brown spots in front of the white and orange two-lobed crest.

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* Reichenbach was of opinion that the herbarium specimen gathered by Mr. G. Ure Skinner at San Salvador, and referred by Lindley to *Brassia maculata*, is the species here described and figured.

Brassia Lanceana, Lindl. in *Bot. Reg.* t. 1784 (1836). *Bot. Mag.* t. 3577 (1837). *Id.* t. 3794 (viridiflora ?). Lindl. Fol. Orch. Brassia, No. 2. Oncidium suaveolens, Rchb. in Walp. Ann. VI. p. 765.

var.—macrostachya.

Flowers much larger, "bright yellow slightly spotted with brown; lip much paler; lateral sepals very acuminate, three or four times longer than the lip."

B. Lanceana macrostachya, Lindl. Fol. Orch. Brassia, No. 2. B. macrostachya, Lindl. *Sert. Orch.* t. 6.

var.—pumila.

Plant dwarf. "Flowers pale yellow stained with dull purple at the base of the sepals; lip contracted in the middle, yellowish brown at the base."

B. Lanceana pumila, Lindl. Fol. Orch. Brassia, No. 2. B. pumila, Lindl. in Bot. Reg. 1845, misc. 62.

The type was discovered in Surinam (Dutch Guiana) by Mr. John Henry Lance, who sent plants to the Horticultural Society of London, in 1834. The variety *macrostachya* was imported from Demerara by Loddiges, in whose nursery it flowered in 1836; it is probably not now in cultivation; it appears to bear a similar relation to the type as *Brassia brachiata* to *B. verrucosa.* The variety *pumila* was gathered by Linden in Caracas, and was cultivated by Mr. Barker, of Birmingham, in 1845; it has probably since disappeared from cultivation.

B. Lawrenceana.

Pseudo-bulbs, leaves and inflorescence as in *Brassia Lanceana.* Sepals and petals light yellow spotted with brown on the basal half, the sepals about 3 inches long, the petals half as long; lip oblong-lanceolate, acute, light yellow; crest two-keeled, truncate in front, white spotted with orange-yellow.

Brassia Lawrenceana, Lind. in *Bot. Reg.* 1841, misc. No. 6, and t. 18. Id. Fol. Orch. Brassia, No. 3. B. cochleata, Knowles and Westc. *Fl. Cab.* t. 53,* ex Lindl. Fol. Orch loc. cit. Oncidium Lawrenceanum, Rchb. in Walp. Ann. VI. p. 766.

var.—longissima.

Flowers much larger and differently coloured, the sepals 7 inches long; sepals and petals orange-yellow with large red-purple blotches on the broader basal portion; lip light yellow with a ring of purple spots at the base; crest two-ridged, slightly pubescent and terminating in tubercles.

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* This drawing is so imperfectly executed that it is impossible to say with certainty to which species the plant it represents should be referred.

B. Lawrenceana longissima, Rchb. in Gard. Chron. 1868, p. 1313. *Bot. Mag.* t. 5748.

The original *Brassia Lawrenceana,* figured by Lindley in the *Botanical Register,* and whose origin is doubtful, was cultivated by Mrs. Lawrence at Ealing Park, in 1840. Knowles and Westcott's *B. cochleata* was sent to Messrs. Low and Co. from Demerara, by their collector Henchman, in 1839. The variety *longissima,* if variety it is, and which immensely surpasses Lindley's type in size and colour, is a native of Costa Rica, and flowered for the first time in this country in Mr. Wentworth Buller's collection at Strete Raleigh, near Exeter, in 1868. It is the most remarkable Brassia known.

Brassia Lawrenceana is only known to us by the figure and description quoted above, and by which we are unable to distinguish it from *B. Lanceana.* The variety *longissima* is a far more distinct form that cannot be referred with certainty to *B. Lanceanum,* and which may hereafter receive separate specific rank. Its habitat too is very remote from the supposed origin of Lindley's type or of Knowles and Westcott's *B. cochleata.*

B. maculata.

Pseudo-bulbs oblong, much compressed, smooth, 3—4 inches long, monophyllous. Leaves narrowly oblong, sub-acute, 6—8 inches long. Scapes as long again as the leaves, many flowered. Sepals and petals yellowish green spotted with brown on the basal half, the sepals about 3 inches, the petals 2 inches long; lip broadly clawed, cordate, acute, cream-white dotted with brown-purple; the bilamellate crest orange-yellow, slightly pubescent.

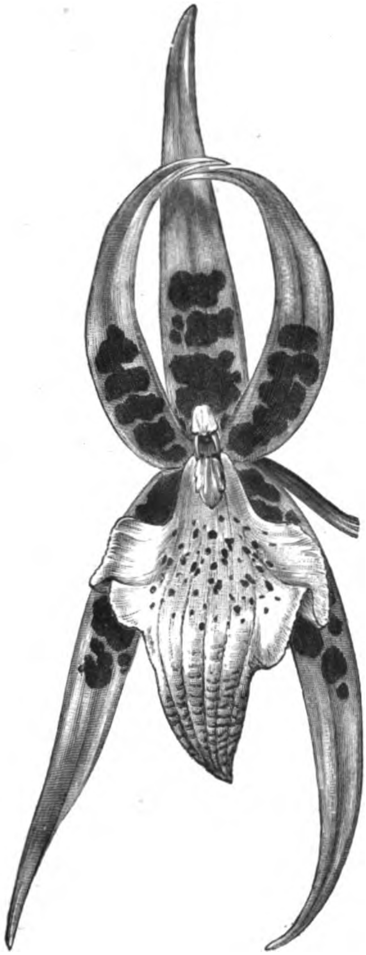
Brassia maculata, R. Br. in Ait. Hort. Kew. ed. 2, V. p. 15 (1813). *Bot. Mag.* t. 1691. Lindl. Gen. et Sp. Orch. p. 212. Id. Fol. Orch. Brassia, No. 1. Paxt. *Mag. Bot. VI.* p. 5. B. Wrayæ, Hook. in *Bot. Mag.* t. 4003. Oncidium Brassia, Rchb. in Walp. Ann. VI. p. 765.

var.—guttata.

"Flowers much smaller and greenish, with the spots distributed pretty equally over the surface."

B. maculata guttata, Lindl. in Fol. Orch. Brassia, No. 1. B. guttata, Lindl. in Pl. Hartw. p. 94.

The species on which the genus was founded and the first Brassia cultivated in British gardens. It was introduced from Jamaica in the early part of the present century by Sir Joseph Banks, who presented plants to the Royal Gardens at Kew, where one of them flowered in April, 1814. The variety *guttata* was gathered by Hartweg in Guatemala, in 1836—7.



Brassia maculata.

B. signata.

Pseudo-bulbs ovoid-oblong, compressed, 3—5 inches long, di-triphyllous. Leaves broadly strap-shaped, sub-acute, 9—12 inches long. Scapes longer than the leaves, 7—10 or more flowered. Flowers small for the genus; sepals and petals bright green spotted with brown on the basal half, the sepals 2 inches long, the petals shorter and narrower; lip oval, shell-like, suddenly contracted to an acuminate tip, white with two brown-purple spots in front of the bilamellate crest, at the base of which is a yellow spot.

Brassia signata, Rchb. in Gard. Chron. XVI. (1881), p. 6.

A small-flowered species introduced in 1881 by Messrs. Backhouse, of which the habitat is not recorded. The above description was taken from a plant that flowered in our houses in May, 1891.

B. verrucosa.

Pseudo-bulbs ovoid, much compressed, 3—4 inches long, ribbed and furrowed on the flattened sides. Leaves linear-acute, 9—12 or more inches long. Scapes as long again as the leaves, mottled with green and dull crimson, 10—15 flowered. Sepals and petals light yellow-green with some dark green spots at the base, the sepals 3—4 inches long, the petals about half as long; lip broadly clawed, cordate, apiculate, white with numerous dark green flattened warts on the claw and basal area of the blade; crest two-lobed, pubescent, orange-yellow with two small white teeth in front.

Brassia verrucosa, Lindl. in Bot. Reg. 1840, misc. No. 66. Id. Fol. Orch. Brassia, No. 9. Batem. *Orch. Mex. et Guat.* t. 22. Oncidium verrucosum, Rchb. in Walp. Ann. VI. p. 769.

A native of Guatemala and probably southern Mexico. It was introduced by Messrs. Rollisson, in whose nursery at Tooting it flowered in April, 1840. The warted labellum well distinguishes this species from all the cultivated Brassias except *B. brachiata*, but this has flowers as large again as those of *B. verrucosa*.

GOMEZA.

R. Br. in Bot. Mag. t. 1748 (1815). Benth. et Hook. Gen. Plant. III. p. 565.

A small genus including five or six species, natives of southern Brazil, having the habit of the smaller Odontoglots, and producing in winter and early spring drooping racemes of pale yellow or greenish flowers that are appreciated for their delightful fragrance. The genus was founded by Dr. Robert Brown on *Gomeza recurva*, a species that was cultivated in the old Apothecaries' Garden at Chelsea in the early part of the present century. It commemorates the name of Bernardino Gomez, a Portuguese physician and botanist. The generic characters will be recognised from the descriptions of the species given below which are well known and frequently met with in orchid collections where they are cultivated on account of their pleasant fragrance and where they are better known as Rodriguezias, Dr. Lindley having unaccountably confounded them with that genus.*

Cultural Note.—Coming from the same region and growing, so far as at present known, under similar conditions as the smaller Brazilian Miltonias, *Miltonia spectabilis*, *M. flavescens*, &c., the cultural treatment of those species is also that which has been found to be most suitable for the Gomezas, and need not therefore be here repeated.

Gomeza Barkeri.

Pseudo-bulbs narrowly oblong, 3—4 inches long, diphyllous. Leaves linear-lanceolate, acute, 5—7 inches long. Scapes longer than the leaves, loosely racemose, many flowered. Flowers light yellow-green with some red spots on the lip and an orange line round the stigma; sepals and petals linear-oblong, undulate, the lateral sepals connate to the middle; lip ovate-oblong, acute, reflexed; crest two small plates produced in front into two short raised lines. Column with a small auricle on each side below the anther.

Gomeza Barkeri, Benth. Gen. Plant. III. p. 566 (1883). Rodriguezia Barkeri, Hook. in *Bot. Mag.* t. 3497 (1836). Odontoglossum Barkeri, Rchb. in Walp. Ann. VI. p. 854 (1864).

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* Quite as inexplicable is the placing of them under Odontoglossum by Reichenbach in Walp. Ann. VI. p. 853.

Introduced from Brazil by Mr. George Barker, of Birmingham; it flowered for the first time in this country in the Botanic Garden of that town in January, 1836. It is the least interesting of the Gomezas now cultivated.

G. foliosa.

Pseudo-bulbs narrowly ovate-oblong, 2—3 inches long, much compressed, diphyllous. Leaves linear, acute, about 6 inches long. Racemes longer than the leaves, the rachis and pedicels very pale green, the latter sheathed by subulate, acuminate bracts as long as themselves. Flowers very fragrant, ¾ inch across vertically; sepals and petals light buff-yellow, the dorsal sepal and petals linear spathulate, undulate; the lateral sepals longer, connate at the base; lip much shorter than the other segments, ovate-oblong, reflexed, light buff yellow with two white keels on the disc. Column wingless, white with an orange spot below the stigma.

Gomeza foliosa, Benth. Gen. Plant. III. p. 566 (1883). Pleurothallis foliosa, Hook. in *Bot. Mag.* t. 2746 (1827). Rodriguezia suaveolens, Lindl. Gen. et. Sp. Orch. p. 195 (1833). Odontoglossum foliosum, Rchb. in Walp. Ann. VI. p. 854 (1864).

First cultivated in the Botanic Garden of Trinity College, Dublin, in 1825, whither it had been introduced from Brazil by the Curator, Mr. Mackay. It is the prettiest and sweetest of the Gomezas; its fragrance has been compared to that of the violet and cowslip combined.

G. planifolia.

Pseudo-bulbs ovoid, compressed, about 2 inches long, diphyllous. Leaves lanceolate, acute, 4—5 inches long, more or less recurved. Racemes longer than the leaves, the rachis and pedicels whitish, the bracts acute and shorter than the stalked ovaries. Flowers light greenish yellow, very fragrant; sepals and petals oblong, acute, undulate, the lateral sepals connate nearly to their tips; lip much shorter than the other segments, broadly oblong, acute, reflexed with two oblong tubercles on the disk. Column white with an orange line round the stigma.

Gomeza planifolia, Benth. Gen. Plant. III. p. 566 (1883). Rodriguezia planifolia, Lindl. Gen. et Sp. Orch. p. 195 (1833). *Bot. Mag.* t. 3504. Odontoglossum planifolium, Rchb. in Walp. Ann. VI. p. 853 (1864).

Introduced by Messrs. Loddiges about the year 1822. It is sometimes confused with the preceding species, from which it is distinguished by its smaller pseudo-bulbs, its broader and shorter leaves, also by the lateral sepals being connate nearly to their tips, and by its differently shaped labellum. Its pleasant fragrance is its chief recommendation.

G. recurva.

Pseudo-bulbs ovoid, compressed with acute edges, 2—3 inches long, di-triphyllous. Leaves linear-oblanceolate, 8—12 inches long. Racemes as long as or longer than the leaves with a pale yellow rachis; bracts awl-shaped, nearly as long as the ovaries. Flowers ¾ inch across vertically, light yellow; dorsal sepal and petals oblong-spathulate, undulate; lateral sepals connate into an oblong blade deeply bifid at the apex; lip shorter than the lateral sepals, ovate, acute, reflexed at the apex and with two short raised plates at the base.

Gomeza recurva, R. Br. in *Bot. Mag.* t. 1748 (1815). Rodriguezia recurva, Lindl. Gen. et Sp. Orch. p. 195 (1832). Odontoglossum recurvum, Rchb. in Walp. Ann. VI. p. 858 (1864).

The species upon which the genus was founded and which had been introduced from Brazil to the Apothecaries' Garden at Chelsea, where it flowered, probably for the first time in this country, in 1815. It seems to have been subsequently lost. We received the specimen from which the above description was taken from the collection of Mr. H. J. Cuming at Foston Hall, Derby, in 1887. It comes very near *Gomeza planifolia*, but it is a more robust plant with larger pseudo-bulbs and leaves, and with longer racemes of brighter yellow flowers.

ADA.

Lindl. Fol. Orch. 1853. Benth. et Hook. Gen. Plant. III. p. 506 (1883).

A small genus of which two species are now known, both of them natives of the Cordilleras of Colombia, and both among the handsomest orchids of their colour ever brought under cultivation. The type species is the well-known *Ada aurantiaca*, which was discovered upwards of half-a-century ago; the second species has only been brought to light within the last few years through the exertions of the excellent orchidologist whose name it bears.

Ada is placed by Mr. Bentham in the small group of genera belonging to the sub-tribe Oncideæ, distinguished by their usually, not always, monophyllous pseudo-bulbs and by their flowers not fully expanding.* It is not known to whom the genus is dedicated.

---

* The group includes Neodryas, Trizeuxis, Ada, Sutrina, Andean genera, and Trigonidium, chiefly British Guianian, in all about twenty species, some of them very curious, but none, with the exception of the two Adas, of any horticultural merit.

Ada aurantiaca.

Pseudo-bulbs in tufts, narrowly ovate-oblong, compressed, 3—4 inches long, mono-diphyllous. Leaves linear-ligulate, acute, 7—12 inches long. Scapes as long as the pseudo-bulbs and terminal leaves taken together, bracteate, the bracts subulate, acute, sheathing, ⅛ inch long; racemes arching, 7—12 or more flowered. Flowers bright cinnabar-red, only expanding from above the middle; sepals and petals linear-lanceolate, very acute, with a sunk median line on the face; the petals shorter and narrower than the sepals and with a purple streak on the median line; lip half as long as the sepals, narrowly oblong, acuminate, with two short keels at the base. Column very short, concave below the stigma.

Ada aurantiaca, Lindl. Fol. Orch. 1853. *Bot. Mag.* t. 5435 (1864). *Illus. hort.* 1872, t. 107. Williams' *Orch. Alb. II.* t. 53. **Brassia cinnabarina**, Lindl. Fol. Orch. Brassia, No. 15 (1853). **Mesospinidium aurantiacum**, Rchb. in Walp. Ann. VI. p. 857 (1864).

This bright-coloured orchid was discovered by the Belgian collector, Schlim, about the year 1851—2 on the eastern Cordillera of New Granada between Ocaña and Pamplona at 8,500 feet elevation. It remained unknown to horticulture till the desire to possess the beautiful Odontoglots from the same region induced the sending of several collectors to New Granada at the same time,* and by whom a few plants of the Ada were sent to Europe in 1853; among the first of these to flower was one in Mr. Bateman's collection at Biddulph Grange, near Congleton, in January, 1864; but the usual flowering season of established plants is February and March. Frequent importations since the date mentioned above have rendered *Ada aurantiaca* one of the best known and most appreciated of cool orchids.

Cultural Note.—Growing at an altitude and under conditions similar to those under which most of the Odontoglots from the same region are found, its cultural treatment is precisely the same as that of the cool Odontoglots.

Ada Lehmanni.†

"Habit of *Ada aurantiaca* but more rigid. Leaves arcuate, linear, acute, coriaceous, dark green more or less marbled with grey blotches, 8—12 inches long. Scapes erect, rather shorter than the leaves, racemes with 5—8 flowers; bracts lanceolate, acute, shorter than the pedicels. Sepals and petals sub-similar, linear-lanceolate, acute, somewhat fleshy,

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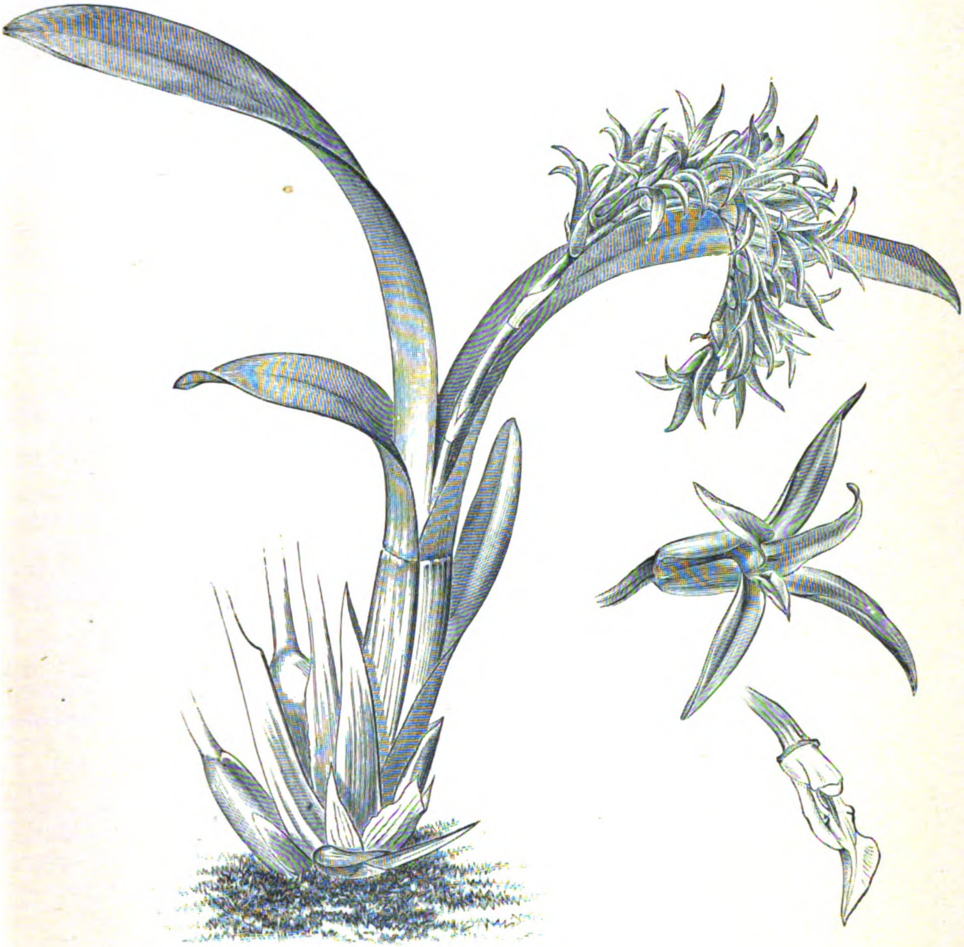
* *See* Odont. p. 30.

† Not seen by us.



Ada aurantiaca.

bright cinnabar-orange; lip oblong-lanceolate, acuminate with incurved undulate margins and recurved apex, about three-quarters as long as the sepals, white except the very fleshy, linear, thickened callus which is deep orange and extends from the base to near the apex, and on each side of which is a recurved white hook. Column short, dull yellow with a pair of large auricles at the base."—R. A. Rolfe in Gard. Chron. X. s. 3 (1891), p. 34.

Ada Lehmanni, Rolfe in Gard. Chron. loc. cit.

"Introduced to Europe by Mr. F. C. Lehmann, the German Consul in the Republic of Colombia, and first brought under notice in September, 1888, by Mr. James O'Brien, of Harrow, who sent it to Kew for determination. It is a very distinct species, distinguished from *Ada aurantiaca* by its more rigid habit, shorter, broader and darker green leaves which are everywhere marbled with grey, and by its white lip; it is also a decidedly summer-flowering plant."

IONOPSIS.

Humboldt et Kunth, Nov. Gen. et Sp. I. p. 348, t. 83 (1815). Benth. et Hook. Gen. Plant. III. p. 567 (1883).

A genus of dwarf epiphytes with small, narrow, stiffish leaves produced in tufts of threes and fours from a creeping rhizome, and with loose panicles of small but very pretty flowers. The following characters described by Lindley, distinctly limit the genus:—

> The sepals and petals are short and erect, of which the two lateral sepals form a small bag; the lip is long, reflexed at the upper half and furnished at the base with four processes, of which two are thin membraneous auricles within the edge of the lip, and two much more fleshy calli within the auricles themselves.*

The species, however, are not so clearly defined, for although nine have been published, it is highly probable that most of them are only varieties of two or three widely dispersed types that are spread over tropical America, including the West Indies, from Mexico to Brazil. The genus was founded by Humboldt and Kunth on *Ionopsis pulchella*, which was discovered by the great traveller in northern Colombia, near Cartagena, and which is still but imperfectly known to science. The name is compounded of ἴον, "a violet," and ὄψις, "the appearance," but why so selected, is not at all clear.

* Folia Orchidacea, Ionopsis, page 1.

Cultural Note.—We have never seen any forms in cultivation besides the two here described. These are usually attached to small blocks or rafts, with some sphagnum around their roots and suspended from the roof of the intermediate house. Like the Oncids of the section EQUITANTIA which they much resemble in habit and aspect, the Ionopses are short lived in the glass-houses of Europe; they have a tendency to produce flowers out of proportion to the strength of the plants, and in order to prolong their life as much as possible, it is advisable to apply a check such as is often applied to species of Phalænopsis, by occasionally removing the incipient inflorescence.

Ionopsis paniculata.

Leaves linear-lanceolate, acute, 4—6 inches long, channelled on the face, keeled behind. Peduncles slender, panicled, 15—20 or more inches long. Flowers numerous, less than an inch across vertically, on slender pedicels sheathed at the base by a minute scale-like bract; sepals and petals white, narrowly oblong, acute, the petals a little the broadest; lip clawed, the blade large in proportion to the other segments, rounded two-lobed, white with a purple spot in front of the small bipartite yellow callus.

Ionopsis paniculata, Lindl. in Bot. Reg. sub. t. 1904 (1836). Id. Fol. Orch. Ionopsis, No. 9. *Bot. Mag.* t. 5541. Van Houtte's *Fl. des Serres, XXII.* t. 2333.

Originally discovered by Descourtilz at the beginning of the present century in the primeval forests of São Paulo, in southern Brazil. It remained unknown to horticulture till it was imported by Messrs. Low and Co., in whose Clapton nursery it flowered for the first time in this country in the autumn of 1864.

I. utricularioides.

Leaves linear, acuminate, curved, 3--4 inches long, green when first developed, changing with age to dull vinous purple. Peduncles slender, dull purple, 9—12 inches long, panicled above. Flowers white, sometimes with a small rose-purple spot at the base of the lip, ¾ inch in diameter, on slender pale purple pedicels; sepals and petals collectively forming a funnel enclosing the column, the sepals lanceolate, the petals oblong, obtuse, longer and broader than the sepals; lip broadly clawed, transversely roundish oblong with a deep sinus in the anterior margin, produced at the base into a short truncate spur, in front of which are two small tubercles

Ionopsis utricularioides, Lindl. in *Collect. Bot.* t. 39 (1821—25). Id. Gen. et Sp. Orch. p. 194. Id. Fol. Orch. Ionopsis, No. 5. I. tenera, Lindl. in *Bot. Reg.* t. 1904 (1836).

This is the best, and next to the type the longest known of all the species of Ionopsis.* It is widely dispersed over Central America from Oaxaca southwards, the West Indian Islands, and the adjacent littoral of Venezuela. It was first introduced into British gardens by Sir Ralph Woodford, who sent it from Trinidad with *Oncidium Papilio* and other orchids to the Horticultural Society of London, in whose garden at Chiswick it flowered in May, 1824. We next read of its being cultivated by Sir Charles Lemon at Carclew in 1836; his plant had been brought from Cuba, and was figured and described in the *Botanical Register* under the name of *Ionopsis tenera.*† The species is a variable one, but the deviations from the type do not appear to be sufficiently distinct to require separate notice.‡

ORNITHOCEPHALUS.

Hook. Exot. Fl. t. 127 (1825). Benth. et Hook. Gen. Plant. III. p. 568 (1883).

A very remarkable genus, of which the most essential character is the long slender rostellum, to which the equally long caudicle or stalk of the pollen masses is attached by means of its terminal glandular disc, the latter organ lying so closely appressed to the elongated rostellum that the two appear to be but one body. This extraordinary structure is shown in the accompanying woodcut of *Ornithocephalus grandiflorus*, figs. 3, 4, and 5, the largest flowered species in the genus, and that in which this curious apparatus can be best seen. About twenty species are known to science, scattered over tropical America from Mexico to southern Brazil, but all of them with the exception of *O. grandiflorus* are diminutive and inconspicuous plants of far greater interest to the botanist than to the horticulturist. Of these species three or four have found their way into British gardens from time to time. *O. ciliatus* is mentioned by Sir Joseph Paxton‖ as being in cultivation in 1844, "but in no way likely to attract notice save by the singularity of its form; and *O. Oberonia* was in the late Mr. Wilson Saunder's collection at Reigate in 1869.*

---

* It is highly probable that Humboldt's *Ionopsis pulchella* and Lindley's *I. utricularioides* are one and the same species.

† There seems to us to be no doubt that this is only a geographical form of *Ionopsis utricularioides*, and we have therefore unhesitatingly referred it to that species.

‡ Lindley has noted five such deviations with the remark that they do not appear to possess any clear marks of distinction; they are evidently geographical forms.

‖ Mag. Bot. XI. p. 70.

The genus was founded by Sir William Hooker on *O. gladiatus*, a native of Trinidad, which was introduced to the Botanic Garden at Glasgow in 1824;† the remarkable form of the column and its appendages suggesting the name which is compounded of ὄρνις ὀρνίθος and κεφαλὴ, literally "a bird's head."

Ornithocephalus grandiflorus.

Leaves narrowly oblong, obtuse, 4—6 inches long, 4—6 on one growth, in the axis of which the small pseudo-bulb is formed. Peduncle from the axil of the uppermost leaf, longer than the leaves, arching, racemose, many flowered; bracts small, subulate, acute. Flowers ¾ inch in diameter; sepals and petals white with a bright green spot at the base, suborbicular, concave, the lateral sepals the smallest and reflexed; lip suborbicular, saccate and strongly keeled beneath, on the short claw of which is a horse-shoe shaped green callus with a crisped fan-like prolongation in front. Column white, bent like a swan's neck, the rostellum of which is produced into a thread-like appendage parallel with the callus of the lip as far as its anterior margin, and then bent upwards and inwards, terminating in a small yellow gland.

Ornithocephalus grandiflorus, Lindl. in Ann. Soc. Nat. Hist. IV. (1840), p. 383. Rchb. in Walp. Ann. VI. p. 493. Id. in Gard. Chron. XVIII. (1882), p. 168. *Belg. hort.* 1884, p. 89.

This is the handsomest species yet known in the genus, and worthy of a place in the most select collections of orchids. It was originally discovered by Gardner on the Organ Mountains in southern Brazil in 1837, and was described by Dr. Lindley shortly afterwards from Gardner's herbarium specimen in the periodical quoted above. Nothing more appears to have been seen of it till 1882, when fresh specimens for identification were sent to Professor Reichenbach by M. Witte, curator of the University Botanic Garden at Leyden, and about the same time from M. Lüddemann at Paris; two years later it was figured in *La Belgique Horticole*, and described by M. Morren from a plant in the Botanic Garden at Brussels. A recent importation has caused it to become well known in British gardens, where it flowers in May and June.

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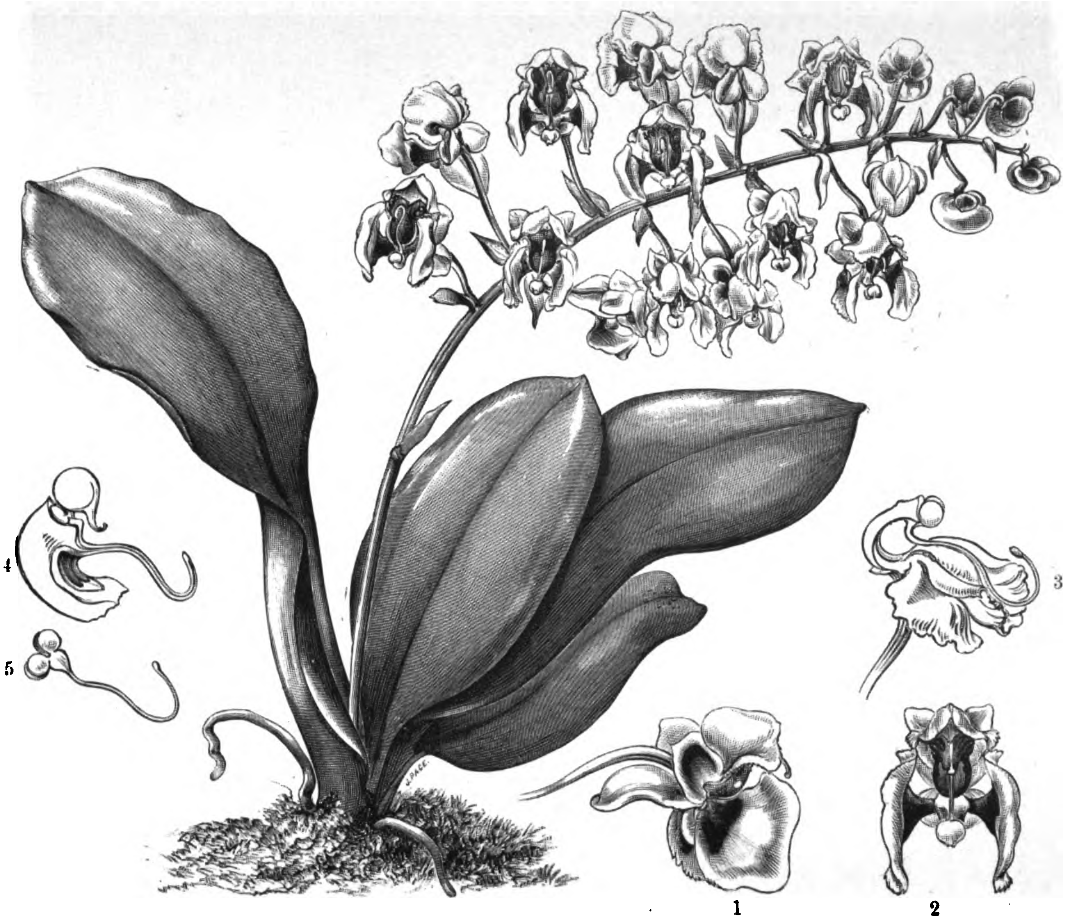
* Gard. Chron. 1869, p. 988.

† Probably through Sir Ralph Woodford, the Governor.



Ornithocephalus grandiflorus.

(1) side view, (2) front view of flower natural size; (3) column and lip, (4) rostellum, (5) pollinia and caudicle, enlarged.

Cultural Note.—No special cultural treatment is required for *Ornithocephalus grandiflorus.* Coming from the Organ Mountains, its geographical station indicates an intermediate temperature in the glass-houses of Europe with the usual attention to watering, etc., which is given to other orchids from the same region.

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The names in italics are varieties or synonyms; those followed by × are hybrids or supposed hybrids.

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ROYAL EXOTIC NURSERY, 544, KING'S ROAD, CHELSEA, S.W

H. M. POLLETT & Co.,
Horticultural and General Steam Printers,
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Vol II
1

A MANUAL

OF

ORCHIDACEOUS PLANTS

CULTIVATED UNDER GLASS IN GREAT BRITAIN.

PART VII.

PHALÆNOPSIS, AËRIDES, VANDA,

ANGRÆCUM, ARACHNANTHE, RENANTHERA, RHYNCHOSTYLIS,
SACCOLABIUM, STAUROPSIS, Etc.

JAMES VEITCH & SONS,
Royal Exotic Nursery, 544, King's Road, Chelsea, S.W.

1891.

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PRELIMINARY NOTICE.

THIS Manual is being compiled to supply amateurs and cultivators of exotic Orchids with a fuller account of the principal genera, species and varieties cultivated under glass, than is contained in the Manuals hitherto in use.

The rapid extension of Orchid culture during the last quarter of a century, resulting from the increased taste for and appreciation of this beautiful and interesting order of plants, has, in our opinion, created the *desideratum* which we are now attempting to supply. The prominent place, too, occupied by Orchids in the columns of the Horticultural Press, and the surprising amount of practical and varied information respecting them disseminated through its agency, has also stimulated the desire to obtain all the leading facts in a condensed form, to which easy reference may at any time be made.

So numerous are the species and varieties of Orchids at present in cultivation, and to which additions are constantly being made by new discoveries and by artificial hybridisation, that the labour attending the compilation of a Manual sufficiently comprehensive to meet the wants of cultivators must necessarily demand much time. Moreover, the present unsatisfactory state of Orchidology, especially in its horticultural aspect and its complicated and unscientific nomenclature, have rendered the compilation of such a Manual within a stated time almost an impossibility.

Under these circumstances, and yielding to the solicitations of patrons and friends, we have decided upon issuing the work in parts, each part containing a monograph of the cultivated species and varieties of one of the most important genera, or of a group of genera.

Little explanation of the plan of the work is here needed; the parts as issued must speak for themselves. We have only to state that in the scientific classification and sequence of the genera we have followed, with but trifling deviations, the arrangement of Bentham and Hooker as elaborated in their *Genera Plantarum*, the most profound and, at the same time, the most intelligible exposition of the Orchideæ extant. In the nomenclature of the species, we have adhered to the Laws of Botanical nomenclature adopted by the International Botanical Congress, held at Paris in August, 1867.

In the description of the species, we have been compelled to use occasionally a few technical terms to avoid cumbrous circumlocutions; at the conclusion of the work we propose giving a glossary of the terms so used. In the cultural notes we have quoted temperatures in the Centigrade scale with the equivalent Fahrenheit readings, in the hope that the far more rational scale, now almost universally adopted in scientific investigations, may also come into use in horticulture. The literary references in italics indicate coloured plates of the species or variety described.

SUB-TRIBE SARCANTHEÆ.

Stems not pseudo-bulbous (monopodial), creeping or ascending, bearing adventitious roots often along their whole length. Leaves distichous, coriaceous, sometimes fleshy. Inflorescence always lateral, axillary or leaf-opposed; flowers sometimes solitary, but more often racemose or paniculate.[*]

STAUROPSIS.

Rchb. in Hamb. Gartenz. 1860, p. 117. Benth. et Hook. Gen. Plant. III. p. 572 (1883).

Stauropsis was founded by Reichenbach on a curious Vanda-like orchid from the Philippine Islands, unknown in cultivation, which Lindley had previously referred to Blume's Trichoglottis, but which does not conform to the essential characters of that genus. Subsequent additions made chiefly by Bentham, have raised the number of species now referred to Stauropsis to six or seven, most of these having been originally described as Vandas, and two of them with *Arachnanthe Lowii,* made sectional under that genus,[†] but the absence of a spur to the labellum, and the different form of the sepals and petals, exclude them from Vanda. These same two species, which are those described *infra,* were referred by Reichenbach to Gaudichaud's Fieldia,[‡] but as this name had been previously taken up by a genus of GESNERIACEÆ [||] it could not be retained, and the two species were accordingly merged by Bentham into Stauropsis. [§]

The name Stauropsis is derived from σταυρὸς (stauros) "a cross," and 'οψις (opsis) "the appearance," but its applicability to this genus is obscure. The cultural treatment of the species here described is the same as that for Aërides and Vanda, and is formulated under the first-named genus.

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[*] These sub-tribal characters are derived exclusively from the vegetative organs of the included species, by far the greater number of which present the formal aspect of an upright stem with strap-shaped often curved leaves pointing in two directions only, so familiar to the cultivators of Vandas, Aërides, Saccolabiums, etc.

[†] Lindley, Fol. Orch. Vanda, p. 2.

[‡] Walper's *Annales Systematicæ VI.* p. 870.

[||] Gen. Plant. II. p. 1012. A monotypic genus, native of Australia, discovered in the early part of the present century, and dedicated to Mr. Barron Field, Judge of the Supreme Court of New South Wales. The species is figured in Bot. Mag. t. 5089.

[§] Journ. Linn. Soc. XVIII. p. 331. Mr. Bentham remarks, "I can discover no difference between these species (*Vanda Batemanii* and *V. gigantea*) and Reichenbach's genus Stauropsis, and have therefore adopted the latter name for the whole group."

Stauropsis fasciata.

Stem as thick as an ordinary writing-pencil, and about 18 inches high in plant observed, from which are produced cord-like, branching, aërial roots several feet long. Leaves very leathery, oblong, obtuse, 3—4 inches long, sometimes apiculate, sometimes unequally two-lobed at the apex. Racemes stoutish, ascending, longer than the leaves, four or more flowered. Flowers 2 inches in diameter, with rather short, three-angled, stalked ovaries; sepals and petals similar and sub-equal, light chestnut-brown barred with yellow, obovate-oblong or elliptic-oblong, acute, the lateral sepals falcately curved; lip three-lobed, shorter than the other segments, white with some red-brown dots on the front lobe, the side lobes erect, nearly hatchet shaped, the intermediate lobe spreading, ovate-oblong, acute, with two falcate auricles at the base, and a rounded erect plate on the disk. Column short, coloured like the sepals and petals.

Stauropsis fasciata, Benth. Gen. Plant. III. p. 572 (1883). Trichoglottis fasciata, Rchb. in Gard. Chron. 1872, p. 699. Williams' *Orch. Alb. V.* t. 208.

The native country of this singular Orchid has not been recorded, but like all the species in this and the nearest allied genera, it is unquestionably of Asiatic origin. It was introduced in 1872. We are indebted to Sir Trevor Lawrence, Bart., for materials for description.

S. gigantea.

Stems robust, thicker than a man's thumb, 20 or more inches high. Leaves broadly strap-shaped, very leathery, recurved, 18—24 inches long, closely imbricating, unequally two-lobed at the apex. Racemes drooping, about a foot long, 6—9 or more flowered. Flowers of coriaceous texture, about 3 inches in diameter, yellow with ocellated chestnut-brown spots, the spots on the sepals darker and more numerous, the lip and column paler; sepals and petals similar and sub-equal, obovate-oblong, obtuse, the sepals stained with dull red-purple behind, the lateral two prominently keeled; the petals smaller than the sepals, and less prominently keeled; lip much smaller than the other segments, fleshy, incurved, linear-oblong, with three white longitudinal keels of which the middle one reaches to the apex, and with two erect, rounded auricles at the base, and a small, two-toothed callus between them. Column three-angled, very short and thick.

Stauropsis gigantea, Benth. in Journ. Linn. Soc .XVIII. p. 331 (1881). Hook. f. Fl. Brit. Ind. VI. p. 27. Vanda gigantea, Lindl. Gen. et Sp. Orch. p. 215 (1832). Id. Fol. Orch. Vanda No. 2. Id. in Gard. Chron. 1858, p. 312. *Bot. Mag.* t. 5189. V. Lindleyana, Griffith Not. ad Plant. Asiat. III, p. 353 (1851). *Illus. hort. VIII.* t. 277. Fieldia gigantea, Rchb. *Xen. Orch. II.* p. 39, t. 112 (1862). Id. Walp. Ann. VI. p. 871 (1864).

First discovered by Dr. Wallich in Moulmein, shortly after the annexation of the province in 1826. Later it was found by Griffith growing on large trees of *Lagerstrœmia Reginæ,* on the banks of the Tenasserim River; and by Thomas Lobb in the locality in which it was first detected by Dr. Wallich. It flowered for the first time in Europe in Mr. Robert Warner's collection at Broomfield, in April, 1858, and at the same time in Mr. Booth's collection at Flotbeck, near Hamburg, its contemporaneous appearance at these places thus affording an opportunity for the examination of fresh materials by the greatest orchid authorities of that time (Lindley and Reichenbach). It was exhibited by Mr. Warner at the meeting of the Horticultural Society of London, held at St. James's Hall on April 21st, where it is reported to have "certainly disappointed expectation," a circumstance which goes far to explain why it is so rarely seen in British gardens at the present time. For materials for description we are indebted to Mr. F. Wigan, of Clare Lawn, East Sheen, whose collection includes some fine old orchids now but rarely met with in cultivation.

The specific name must be assumed to refer to the large size of the flowers and leaves rather than to the habit of the plant, which under cultivation has never been observed to attain but moderate dimensions compared with the Goliath-like stature of its congener next to be described.

S. lissochiloides.

Stem very stout, ligneous below, attaining a height of several feet, and 1—2 inches in diameter. Leaves spreading or slightly decurved, broadly ligulate, 18—24 inches long, embracing the stem at their base, unequally bilobate at apex, very rigid and coriaceous. Racemes suberect, longer than the leaves, 12—20 flowered. Flowers fleshy, 3 inches in diameter, somewhat distantly placed along the rachis, on green twisted pedicels, each with six shallow keels; sepals and petals similar and sub-equal, obovate-oblong, yellow densely spotted with red-purple, purplish crimson beneath, the margins becoming reflexed as the flower increases in age; lip like a pelican's bill, three-lobed, the side-lobes rotund, erect, buff-yellow with longitudinal veins, between them is a thick, rounded, raised plate; the anterior lobe fleshy, boat-shaped, with three shallow keels above, and a broader one with a median sunk line beneath. Column very short and thick, red freckled with yellow above, white and purple around the stigmatic hollow.

Stauropsis lissochiloides, Benth. in Journ. Linn. Soc. XVIII. p. 381 (1881). Vanda lissochiloides, Lindl. Gen. et Sp. Orch. p. 216 (1832). Blume, *Rumphia IV.* p. 41, t. 194. V. Batemanii, Lindl. *Bot. Reg.* 1846, t. 59 (Batemanni). Id. Fol. Orch. Vanda, No. 1 (1853). Van Houtte's *Fl. des Serres XVIII.* t. 1921-2. Fieldia lissochiloides, Gaudichaud, Voyage, p. 424, t 36 (1826). Rchb. Xen. Orch. II. p. 38 (1862). Id. Walp. Ann. VI. p. 870 (1864).

The botanical history of this remarkable orchid is sketched in outline by the literary quotations given above, which we now proceed to fill up. It was first made known to science by the French botanist, Gaudichaud, who discovered it growing on large trees and on bare rocks, on one of the small islands in the Molucca group during his trip in the ill-fated vessel *L'Uranie*, commissioned by the French Government in 1817 to sail on a voyage of discovery round the world, and which was wrecked on the Falkland Islands in 1820;* chiefly owing to this accident the botanical results of the voyage were not published till 1826. He founded upon this orchid the genus Fieldia, in compliment to Mr. Barron Field, of Sydney, New South Wales, at whose hands he had received great kindness during his stay in the then infant colony†; but Lindley when compiling his *Genera and Species of Orchidaceous Plants* referred it to Vanda, retaining Gaudichaud's specific name *lissochiloides*; Reichenbach, however, adopted Gaudichaud's genus Fieldia many years afterwards in his synopsis of the ORCHIDEÆ, published in Walper's *Annales Systematicæ*, Vol. VI., *loc. cit. supra*, but it could not be retained for the reason already stated. In the meantime the plant had been re-discovered by the Dutch botanist, Blume, on the island of Bali, situated near the eastern extremity of Java, growing in the same manner as observed by Gaudichaud. It remained unknown to horticulture till 1841—2, when it was sent by Cuming from the Philippine Islands. It flowered for the first time in this country in Mr. Bateman's collection at Biddulph Grange in Staffordshire, in the summer of 1846. Dr. Lindley availed himself of the occasion to figure and describe the plant in the *Botanical Register* of that year, changing the specific name to *Batemanii* in compliment to the most prominent orchid amateur of that time, assigning as a reason that "there is only the slenderest resemblance between the flowers of this plant and those of the terrestrial African genus, Lissochilus." * The late Mr. John Gould Veitch visited the Philippine Islands in 1864, and detected this orchid growing in great abundance close to the sea-shore on the small island of Guimares in company with *Cypripedium philippinense*, and quite recently it has been observed by David Burke and other collectors on that island and also in Mindanao. In the last-named locality it grows fully exposed on bare rocks on the sea-shore, often within a few feet of high water mark. The stems sometimes attain a height of ten to twelve feet, from which are produced numerous stout, cord-like roots that cling so firmly to the rocks to which the plants affix themselves as to resist the force of the monsoon, which blows with a violence unknown in this climate. It is scarcely less abundant on many of the small uninhabited coral islets scattered among the Molucca group, where it grows under the same conditions as in Mindanao.

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* Charles Gaudichaud-Beaupré was one of the most laborious travellers of his time, and the very many discoveries he made, and his great and protracted sufferings in the cause of science, should preserve his name from oblivion. He was born at Angoulême in 1780. He became "Pharmacien de la marine" in 1810, and in that capacity he was attached to the exploring ship, *L'Uranie*. He subsequently made long voyages in *La Physicienne*, *L'Harmonie* and *La Bonté*, during which he visited many tropical and subtropical countries, both in the Eastern and Western Hemispheres. After his return to his native country from his last voyage, he devoted much of his time to botanical pursuits; but he had suffered so much from the effects of his voyages that he was very feeble and infirm for several years prior to his death, which happened at Paris in 1854.

† See page 1.

As a horticultural plant *Stauropsis lissochiloides* is confined to comparatively few collections. It is a giant among orchids, comparable in this respect with *Angræcum eburneum*, and hence its unwieldy size takes up more house-room than can be conveniently assigned to it. Moreover, its flowers, although handsome and lasting upwards of three months, are surpassed in attractiveness by many of the dwarfer species of Vanda.

ARACHNANTHE.

Blume., Flor. jav. Praef. p. 6 (1828). Id. Rumphia IV. p. 55, t. 196 (1850). Benth. et Hook. Gen. Plant. III. p. 572 (1883).

Under Arachnanthe are now brought two of the most remarkable orchids seen in European gardens, viz., *Arachnanthe Cathcartii* and *A. Lowii*. They were both originally introduced as Vandas, but have since been removed from that genus chiefly on account of the different form of their perianth segments, especially the labellum which is neither saccate nor spurred, moreover it is articulated on the base of the column, and motile, not affixed to it as in Vanda. To these must be added *A. Clarkei*, a fine species recently introduced from the Sikkim Himalaya, but which is still comparatively rare in British gardens. These three species are the only Arachnanthes at present in cultivation.

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* Adding, "The name (lissochiloides) is, however, on record, and the strict rules of botanical nomenclature seem to forbid the change, but it is so manifestly absurd to retain for a plant a name that has originated in some misconception, that we venture for once to disregard the rule for the sake of common sense." If names are to be altered "for the sake of common sense," *Stauropsis lissochiloides* is certainly not singular in that respect.

The genus was founded by Blume on the Linnean *Epidendrum Flos-aëris*, which he described and figured in his *Rumphia* under the name of *Arachnanthe moschifera*, a curious orchid, widely distributed over the Malay Archipelago, and formerly, if not at present, cultivated in Japan, where it was noted and figured by Kaempfer in his *Amœnitates*,* towards the end of the seventeenth century. To this, the type species, Mr. Bentham added the two species first named above, and two others — not in cultivation — previously referred to Renanthera by Lindley and Reichenbach; † and subsequently another species, discovered by the late Dr. Maingay in Malacca, has been added by Sir J. D. Hooker.‡ The number of species now included in the genus is six.

The generic name is derived from ἀράχνη (arachne), "a spider," and ἄνθος (anthos)," a flower," from a fancied resemblance of the markings on the flower of the type species to the cobweb of a spider.

Arachnanthe Cathcartii.

Stem as thick as an ordinary writing pencil, several feet long, leafy along the distal half or more.§ Leaves linear-oblong, 6—8 inches long, unequally two-lobed at the apex, recurved, very leathery. Racemes stoutish, longer than the leaves, 3 — 5 or more flowered. Flowers distant, 3 inches in diameter; sepals and petals similar and sub-equal, orbicular-oblong, concave, pale yellow, crossed by numerous wavy, often confluent red-brown bands; lip three-lobed, the side lobes small, roundish oblong, incurved, white streaked with red; the intermediate lobe yellow, reniform with obscurely dentate margin, the centre very thick with crenate border; calli two-ribbed, fleshy, pale yellow spotted with red. Column very thick, buff-yellow passing into red-brown around the stigma and anther.

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* Notes and sketches of what the traveller saw, and which he afterwards published in a book under this name.

† *Renanthera Sulingii*, Lindl. Gen. et Sp. Orch. p. 217, and Rchb. Xen. Orch. II. p. 41, t. 113. *R. bilinguis*, Rchb. Xen. Orch. I. p. 7, t. 4.

‡ Flora of British India, VI. p. 28.

§ "This plant as well as *Arachnanthe Clarkei* is distinctly pendulous in habit, an never under any conditions does it assume an erect position in the Himalayan forests." "R. P." in Gard. Chron. VIII. s. 3 (1890), p. 269.

Arachnanthe Cathcartii, Benth. in Journ. Linn. Soc. XVIII. p. 332 (1881). Gen. Plant. III. p. 573. Hook. f. Fl. Br. Ind. VI. p. 27. Pfitzer, Grundzüge, p. 11, with fig. (1882). Vanda Cathcartii, Lindl. Fol. Orch. Vanda, No. 17 (1853). Hook. f. *Illus. Himal. Pl.* t. 23. *Bot. Mag.* t. 5845. *Illus. hort. V.* t. 187 (copied from Illus. Himal. Pl). Van Houtte's *Fl. des Serres. XII.* t. 1251 (also copied from Illus. Himal. Pl.). Gard. Chron. 1870, p. 1409, icon. xyl. *Fl. Mag.* N.S. t. 66. Jennings' *Orch.* t. 10. Williams' *Orch. Alb. IV.* t. 168. Esmeralda Cathcartii, Rchb. Xen. Orch. II. p. 39 (1862). Id. Walper's Ann. VI. p. 871 (1864).

To meet the exigencies of a progressive science like Botany, a change in the nomenclature of certain plants is often unavoidable. Several causes may arise to necessitate such a change, for example—the genus to which a species is first referred may not have been clearly circumscribed, or it may have been thrown into confusion by the addition of species that do not conform to its essential characters. *Vanda Cathcartii* is an instance of this; so long ago as 1862 the late Professor Reichenbach challenged the propriety of referring this plant to Vanda, and created for its reception a new genus which he called Esmeralda;* but the change seems to have attracted but little notice till the revision of the ORCHIDEÆ was undertaken by Mr. Bentham for the *Genera Plantarum.* That eminent systematist, although agreeing with Reichenbach as to the propriety of removing it from Vanda, found it unnecessary to adopt his Esmeralda, as the flowers conform sufficiently to Blume's much older genus, Arachnanthe; and he accordingly brought it under that genus.

The following particulars of its origin are given by Sir J. D. Hooker in the *Botanical Magazine,* sub. t. 5845:—"It is a native of hot, damp, shady valleys in the eastern Himalaya, delighting in the neighbourhood of waterfalls where it is exposed to constant humidity; it was discovered by myself in 1848, and transmitted to the Calcutta Botanic Garden, where, after flowering, it was sent off to England, but did not survive the voyage.† Repeated attempts were subsequently made to introduce it with more or less success, and the honour of first flowering it in this country is, I believe, due to Messrs. Veitch, whose plant produced one flower in March of the present year (1870)." From that time forward *Arachnanthe*

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* Xen. Orch. II. loc. cit. supra.

† Reichenbach affirms that it had been previously discovered by Griffith. "Lange vor der Reise von J. D. Hooker und Thomson hatte sie Herr Lindley von Griffith mit zahlreichen Blüthen anderer Seltenheiten in grossen Alkoholgläsern." Xen. Orch. II. t. 39.

Cathcartii has occasionally had a place in many orchid collections both in Europe and America, and the estimation in which it has been held by horticulturists has found expression in the numerous coloured plates of it that have appeared in gardening publications. It usually flowers in the early months of the year, but it is not an uncommon occurrence for its racemes to be produced much later, and even in opposite seasons. The species is dedicated to the memory of Mr. James F. Cathcart, of the Indian Civil Service, an ardent amateur naturalist, and one of the earliest explorers of the rich flora of the eastern Himalaya.* For materials for description and figuring we are indebted to Mons. le Duc de Massa, of the Château de Franconville, near Luzarches, in France, and Mr. Charles J. Lucas, of Warnham Court, near Horsham.

Cultural Note.—Arachnanthe Cathcartii has always been a difficult plant to import alive, and even when it survives the voyage to Europe the most solicitous care on the part of the cultivator frequently fails to preserve it alive for any length of time in the glass houses of this country. At least two circumstances may be adduced as probable causes of failure: the impossibility of approximately imitating the climatic conditions under which it thrives in its native home, and the delicate constitution of the plant itself derived from its environment, by which it is deprived of the hardening influence of direct sunlight. "Thickly wooded gorges in close proximity to streams where light is of the most sombre description, quite beyond the warming influence of the sun, and where a continual high state of humidity during the whole year is maintained, are one and all necessary to its existence . . . From May till October the forests are maintained in a constant state of saturation by a drenching and almost continuous rainfall, while, during the other half of the year, a high degree of humidity is kept up by the splashing of the stream a few feet off, and the dense canopy of foliage overhead that checks evaporation."† Hence it is that good specimens, growing freely and flowering regularly, are rarely seen in British orchid collections, and therefore it is with much satisfaction that we are enabled to record an instance of the successful cultivation of this orchid in the garden of Sir George Macleay at Pendell Court, Bletchingley. Here "the plant is trained against a wall partly over a water tank in a small stove, where the temperature during winter is about 12°—15° C. (55°—60° F.), and the wall always more or less damp from the

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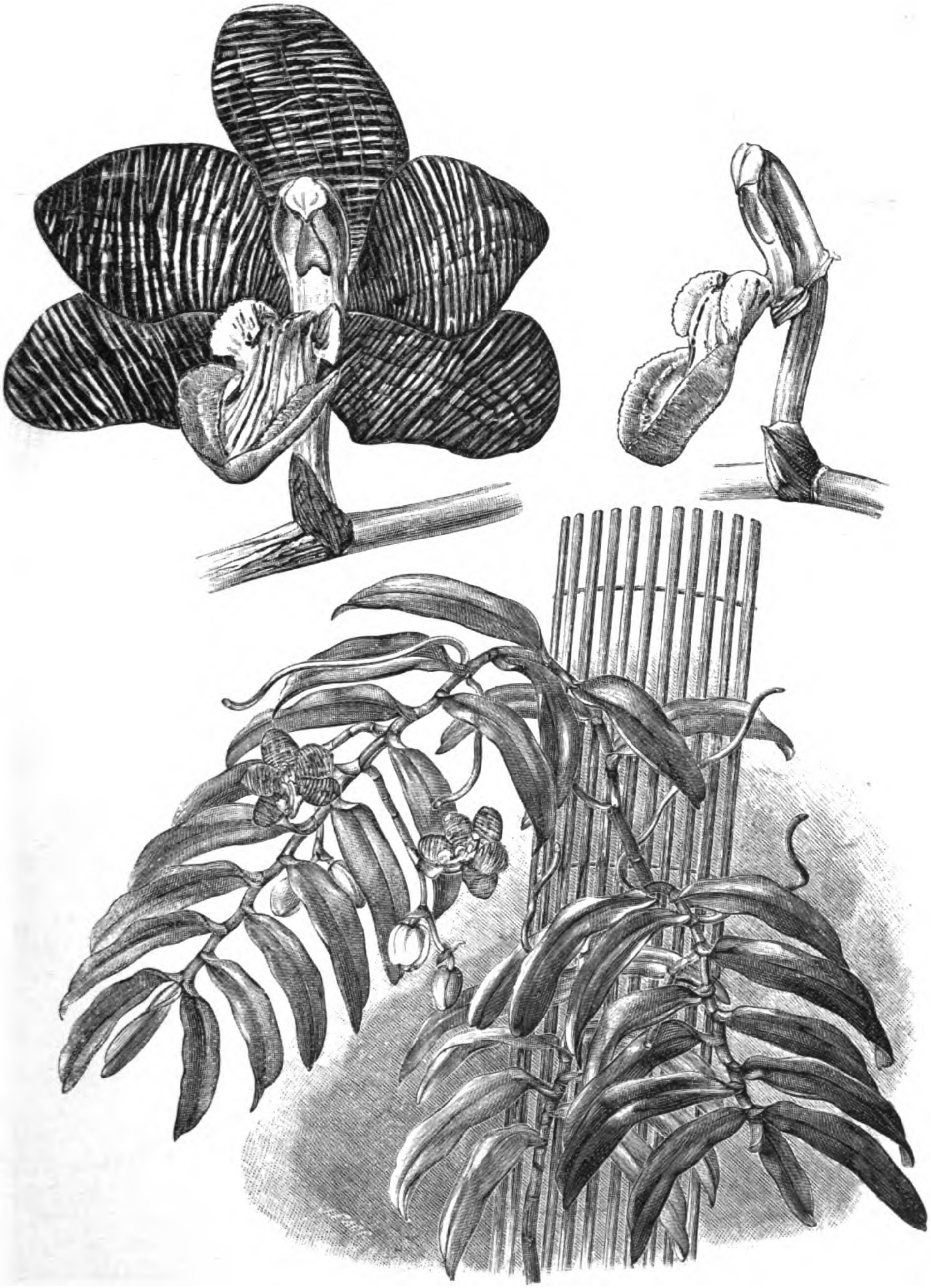
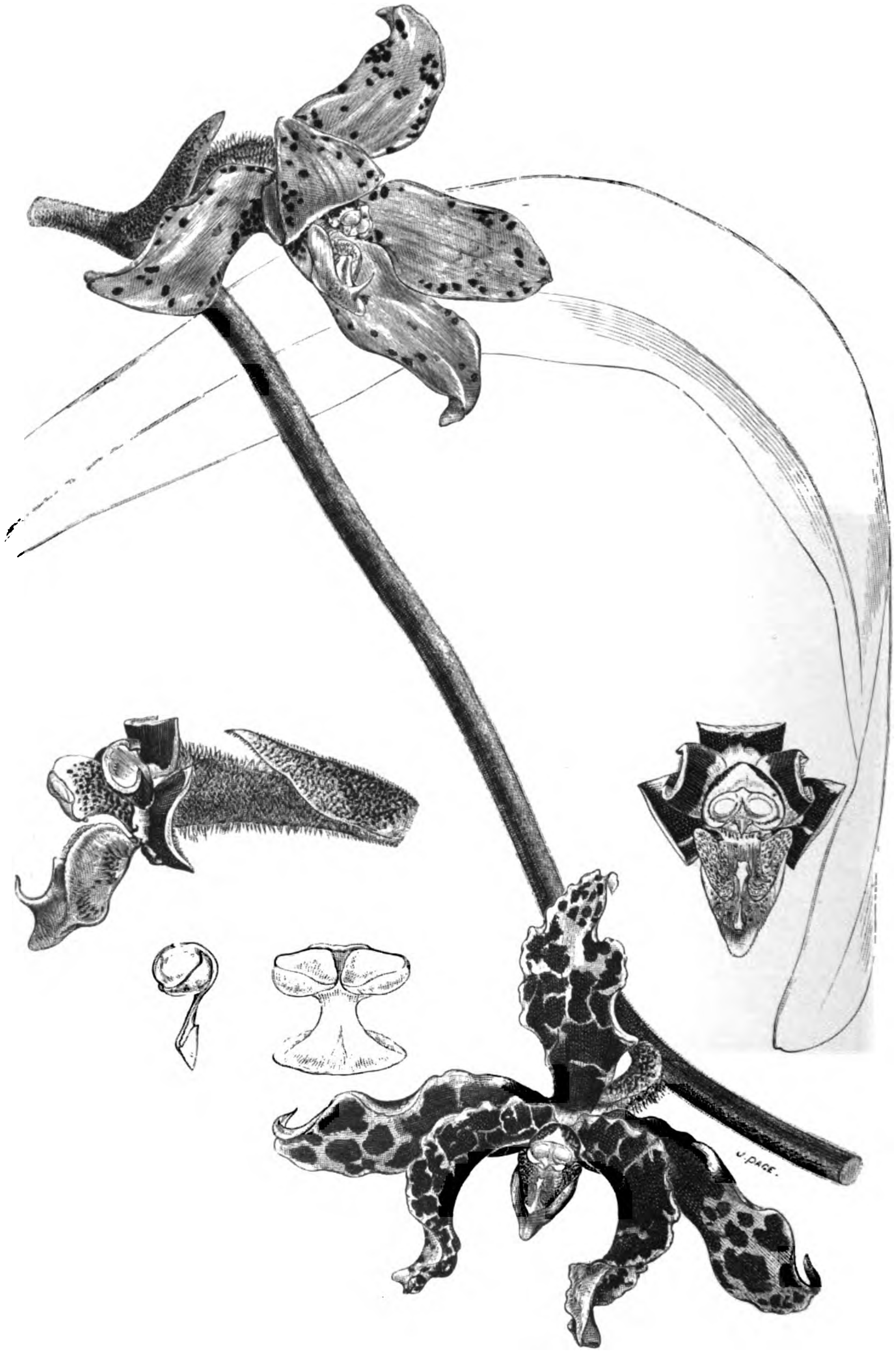
*An account of his life and labours is given by Sir J. D. Hooker in the introduction to his *Illustrations of Himalayan Plants.*

†"R. P." in Gard. Chron. VIII. s. 3 (1890), p. 269.



Arachnanthe Cathcartii.



Arachnanthe Lowii.

moisture arising from the tank. In this situation the lowermost breaks also flower, but which, when detached from the parent plant, fail to do so. Moreover the old plant seems to suffer if it be shortened in the manner sometimes practised on some species of Vanda." *

A. Clarkei.

Stem as thick as an ordinary writing pencil, about a foot high in plants observed. Leaves linear-oblong, 3—6 inches long, gradually shorter upwards, unequally bilobate at apex. Peduncles ascending, 2—3 flowered. Flowers 3 inches in diameter; sepals and petals bright chestnut-brown barred with light yellow, the sepals linear-oblong, cuneate at the base, the lateral two falcately curved; petals similar but narrower; lip three-lobed, a little shorter than the other segments, the basal lobes erect, rotund, light yellow, almost white, streaked with red, the front lobe fleshy, "broadly roundish with a small lobule at the apex," chestnut-brown with 7—9 radiating white keels, of which the middle one is the broadest.

Arachnanthe Clarkei, Rolfe in Gard. Chron. IV. s. 3 (1888), p. 567. *Bot. Mag.* t. 7077. Hook. f. Fl. Brit. Ind. VI. p. 28. Esmeralda Clarkei, Rchb. in Gard. Chron. XXVI. (1886), p. 552.

Discovered in 1875 in the Sikkim Himalaya, at 6,000 feet elevation, by Mr. C. B. Clarke, F.R.S., the excellent Indian botanist, and introduced by Messrs. Low and Co., of Clapton, in 1885 or 6; it flowered for the first time in this country in the autumn of 1886, in the collection of the late Mr. John Day, at Tottenham. Its near affinity to *Arachnanthe Cathcartii* was recognised by the late Professor Reichenbach, who referred it to his genus Esmeralda as *E. Clarkei*, but for the reason already stated, that name cannot be accepted. As in *A. Cathcartii*, the labellum is a most curious organ; it is articulated to the foot of the column in such a way that the slightest touch imparts to it an oscillatory motion. *A. Clarkei* flowers in September and October.

The conditions under which *Arachnanthe Clarkei* grows in the Sikkim Himalaya are thus described by a correspondent of the *Gardeners' Chronicle*; they afford, therefore, indications for its cultural treatment. "It occurs on a thickly wooded crest or ridge, at an altitude of about 6,000 feet, where sun and wind have free play amidst its surroundings, drenched with cool rain and driving mists during the wet season, exposed to a fair amount of sunshine during the remainder of the year, and visited by a sprinkling of snow at the commencement of the new year. At this altitude the temperature during the hottest month of the year, rarely exceeds 24° C. (75° F.) in the shade, while in the two coldest winter months the thermometer ranges from about —1° to + 7° C. (30°—45° F.). As a consequence of being exposed to the hardening influence of the weather *A. Clarkei* assumes a much more stunted appearance, and never at any time approaches the straggling length of *A. Cathcartii.* The flowers open in October and last about six weeks."*

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* Communicated to the *Gardeners' Chronicle, III.* s. 3 (1888), p. 106, by Mr. F. Ross.

A. Lowii.

Stems robust, often an inch in diameter, attaining a length of 3—5 or more feet under cultivation, and sometimes branched near the base. Leaves spreading, linear-oblong or strap-shaped, 20—30 inches long, complicate at base, two-lobed at apex, deep glossy green. Racemes several, from the axils of the leaves, 6—9 or more feet long, pendulous, the rachis crimsonish brown, scabrous, pubescent, bearing flowers along the entire length at intervals of 3—5 inches. Flowers dimorphous with pedicel and ovary less than an inch long, clothed with a dense, hispid, pale brown pubescence, and sheathed on the lower side by a broadly ovate acute, green bract; the two (rarely three—four under cultivation†) lowermost flowers with broader, shorter, and more fleshy sepals and petals that are elliptic-oblong, bright tawny yellow with some brown dots sprinkled over the surface; the ordinary flowers about 3 inches in diameter, with linear-oblong, acute, undulated sepals and petals, deep red or chocolate-brown, with some light yellow spaces chiefly towards and at the apex; lip identical in structure in both kinds of flowers, much shorter than the other segments, somewhat slipper-shaped with the toe much contracted, on which is an incurved horn, and behind this a short fleshy plate, the central area light purple, the remainder yellow spotted with purple, except the apex and horn which are wholly yellow. Column very short and thick, greenish spotted with purple above, white dotted with rose in front.

Arachnanthe Lowii, Benth. in Journ. Linn. Soc. XVIII. p. 331 (1881). Id. Gen. Plant. III. p. 573. Rolfe in Gard. Chron. IV. s. 3 (1888), p. 628. Vanda Lowii, Lindl. in Gard. Chron. 1847, p. 239. Id. Fol. Orch. Vanda No. 3 (1853). *Illus. hort. XI.* t. 417. De Puydt, *Les Orch.* t. 46. Warner's *Sel. Orch. II.* t. 4. Renanthera Lowii, Rchb. Xen. Orch. I. p. 89 (1855). *Bot. Mag.* t. 5475. Van Houtte's *Fl. des Serres. XXI.* t. 2256—7. Sander's *Reichenbachia II.* t. 71. Vanda Lindleyana, Hort. Low (not Griffith).

var.—Rohdeniana.

Plant dwarfer, with the leaves narrower and shorter than in the type. The lowermost yellow flowers, four in number, placed closer together, and separated from the ordinary ones by an interval of 9—12 inches; the latter of a brighter colour and differently spotted.

A. Lowii Rohdeniana, supra. Vanda Rohdeniana, Hort. Lüddemann.

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* "R. P." in Gard. Chron. VIII. s. 3 (1890), p. 269.

† One—four in a wild state, in which they have never been observed to be entirely absent.

Among the many fine orchids discovered by Sir Hugh Low in Saràwak, this is unquestionably the most remarkable, for it possesses characters so distinct from every known orchid that it may well be doubted whether its relegation to Arachnanthe by Bentham is destined to be final; for the present it may be best left where the eminent systematist has placed it. In the absence of any published date, it may be assumed that Sir H. Low first detected it in 1845 or 6, about which time he sent it to his father at the Clapton Nursery, with the request that it might be called *Vanda Lindleyana,* in compliment to the most distinguished orchidologist of that time. Dr. Lindley, however, declined the honour, and transferred the name to the discoverer, "who certainly ought, before all others, to be associated with one of the finest which he has discovered in Borneo."*

The aspect of this orchid in its wild state is most peculiar. As seen by Sir Hugh Low, "the plants were hanging horizontally from the main stem of a large tree, from each of which depended two, three or four chains of flowers, ten to twelve feet long."† The observations of later collectors all bear testimony to the same remarkable appearance of the plants when in flower, with the addition that from some of the older plants as many as eight or ten long, pendulous racemes have been counted. *Arachnanthe Lowii* is always found in the neighbourhood of water, generally on the higher branches of the loftiest trees along the river banks, and overhanging the smaller streams sometimes in company with *Cypripedium Lowii.* It is abundant in the low, swampy forest near the coast of Saràwak, where it was collected by Curtis, who informed us that in the rainy season many of the trees on which it grows are only accessible by means of a canoe. Since its first discovery *A. Lowii* has been frequently imported, but owing to the length of time required for transmission, and perhaps the peculiar constitution of the plants themselves, derived from their environment in their native home, not many are preserved alive for a long time after their arrival in Europe; but when once established they will live and flower for many years under the same cultural treatment as that given to the tall-growing species of Vanda. One of the first plants to flower in England was sent home by our collector, Thomas Lobb, which flowered imperfectly at Exeter the second or third year after its arrival; but it was not till the autumn of 1862, when this grand orchid flowered in greater perfection in the collection of the late Mr. Sigismund Rucker, at West Hill, Wandsworth, that the extraordinary character of the inflorescence was first fully appreciated. A plant had previously flowered in the collection of Herr Reichenheim, at Berlin, and after an examination of fresh materials supplied from that collection, the late Professor Reichenbach removed the species from Vanda to Renanthera.

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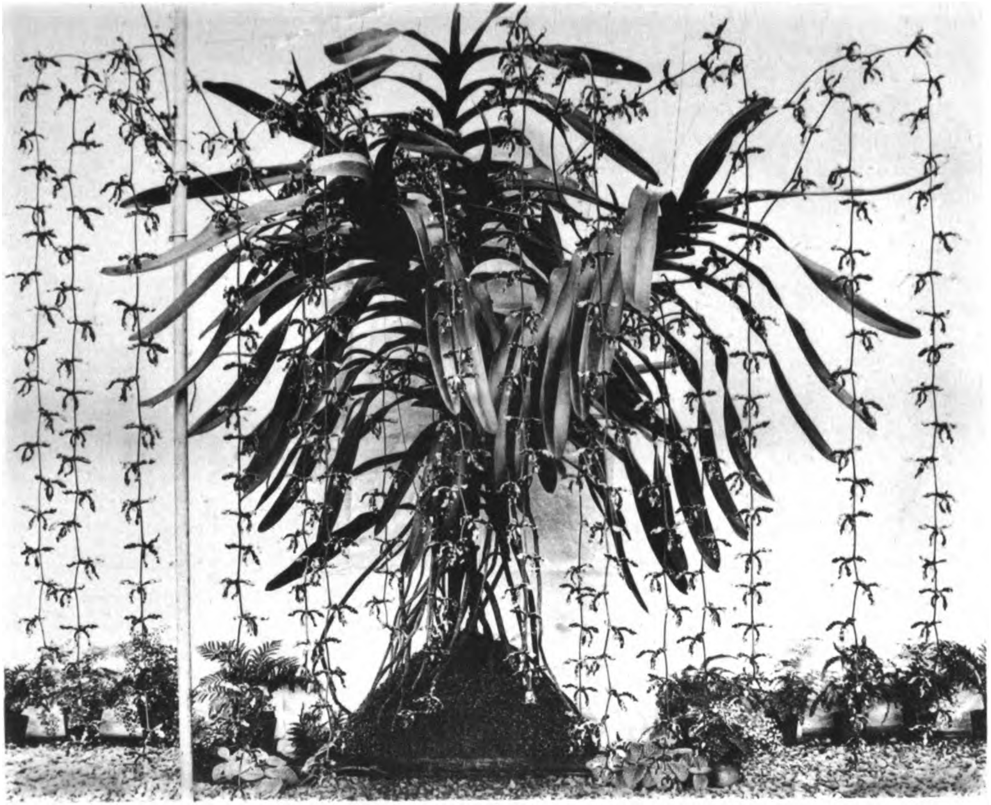
*Gard. Chron. 1847, p. 289.

† Idem.

It is not so much the unusual appearance of the inflorescence itself that arrests the attention of the beholder, as the constant occurrence of two kinds of flowers on the same raceme, the two (sometimes three) lowermost being somewhat larger than the others, their perianth segments broader, and of a bright orange or tawny yellow dotted with red-purple, while all the others are deep chocolate-brown bordered and streaked with yellow. An examination of the two kinds of flowers produced by a plant in one of our houses in the summer of 1889 convinced us that structurally they are essentially the same. The dimorphism remains a mystery that has yet to be solved.

One of our illustrations represents the flowering of the grand plant of *Arachnanthe Lowii* in the collection of Baron Alphonse de Rothschild at Ferrières-en-Brie, in France, in July, 1885. M. Bergman, to whose courtesy we are indebted for the illustration, informs us that in 1887, when the plant flowered again, the inflorescence was still more extraordinary, and that 650 flowers were counted on the plant on that occasion.

Deviations from the usual type occasionally occur. The variety described above first appeared in M. Lüddemann's nursery at Paris, and is now in the collection of M. le Duc de Massa at the Château de Franconville, near Luzarches, in France. A raceme kindly sent to us by Monsieur le Duc showed no tangible character by which the plant can be specifically separated from the type, and the name, *Rohdeniana*, under which it is cultivated, can only be regarded as a varietal one for garden use. *Renanthera Rohaniana*, described by Reichenbach in *Xenia Orchidacea*, *I.* p. 89, is unknown to us. It is said to differ from *Arachnanthe* (*Renanthera*) *Lowii* in the keel of the lip; it was in cultivation 30 years ago in the collection of Prince Camille de Rohan, at Sichrow, in Bohemia.



Arachnanthe (Vanda) Lowii

In the garden of Baron Alphonse de Rothschild, at Ferrières-en-Brie, France, July, 1885.

PHALÆNOPSIS.

Blume Bijdr. p. 294 (1825). Id. Rumphia IV. p. 52, t. 199 (1848). Benth. et. Hook. Gen. Plant. III. p. 573 (1883).

The sub-tribe of which we are now treating is exceptionally rich in species that are in high favour with orchid amateurs, and among them several of the Phalænopses unquestionably occupy the foremost rank. This is owing, not only to the surpassing beauty and attractiveness of their flowers, especially of those species included in Bentham's section, EUPHALÆNOPSIS, but also to their peculiar form, by which they may be distinguished at a glance from all other cultivated orchids. These species and the hybrids derived from them also produce their flowers in great profusion, and continue long in bloom at a season when exotic flowers are much appreciated. Besides these well-known favourites, there are now brought under Phalænopsis a goodly number of "forms" whose flowers are of different aspect and texture, but which conform to the essential characters of the genus as at present circumscribed. These with the first mentioned group form a series which connect the genus with Arachnanthe on the one hand, and with Doritis on the other, a small genus including about five species, and to which is now referred *Phalænopsis Wightii* (Rchb.) In the chain of affinities presented by this series, occasional interruptions occur that may be bridged over by future discoveries, but which serve at present to limit sectional divisions. Moreover the genus has been enlarged by the introduction of several undoubted natural hybrids, and by others obtained artificially in the glass houses of Europe. In its horticultural aspect Phalænopsis therefore presents a very varied and interesting group of species and hybrids, not less remarkable for the range of colour than for the variety in form and texture observable in the flowers.

The following diagnosis includes all the most important floral characteristics of Phalænopsis.

> The *sepals* are free and spreading
>
> The *petals* are similar, or much broader and then contracted at the base, rarely narrower.
>
> The *labellum* is attached to the apex of the short foot of the column, or continuous with it; it is spurless, spreading, or at a small angle with the column.*

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* Throughout the genus the labellum is of very complex structure, exceedingly difficult to describe in words.

The *column* is semi-terete, straight or slightly curved, and produced at the base into a short foot.

The *pollinia* are sub-globose, waxy, usually of a deep orange-red, and attached to the gland by a long slender caudicle.

The *capsule* is sub-cylindric, almost fusiform, with six furrows in EUPHALÆNOPSIS; angulate with the perianth segments persistent in STAUROGLOTTIS.

In their vegetation the Phalænopses are dwarf epiphytal herbs that attach themselves to the stems and branches of large trees, generally in shade, always in proximity to water, whether as running streams, the deltas of rivers, or close to the sea-shore. A few species, as *Phalænopsis Lowii*, *P. Parishii*, and *P. Esmeralda*, are deciduous in their native home, and grow on the branches of small bushes and even on limestone rocks.

The *stems* are very short and are sheathed by the bases of the leaves. From their base are produced numerous flexuose, aërial *roots*, that in most of the species of Phalænopsis proper are compressed, rugose, of a dull brown or greyish hue, and cling with extraordinary tenacity to the surfaces over which they creep. In other species the roots are cylindric, smooth, somewhat slender, at first green, changing with age to a greyish white; roots with characters intermediate between these are also of frequent occurrence.

The *leaves*, always few in number, are distichously arranged as in the allied genera, but the arrangement is often more or less apparently distorted, owing to the shortness of the stems on which they are close-set. They are usually of ovate, oblong, or obovate-oblong form, often very large, leathery in texture, and of a glossy green, but in a few species mottled with grey.

The *peduncles* are either simple and few flowered, or branched and many flowered, in the latter case sometimes attaining a considerable size; the bracts are usually small, ovate, and appressed to the base of the ovary.

A morphological peculiarity that occurs in the roots and peduncles of Phalænopsis has here to be noticed. Both organs are proliferous, that is to say, adventitious buds are produced by them, which, under favourable circumstances, ultimately develop into young plants that may be detached from their parent; the rate of development is, however, often extremely slow. Proliferous roots have been observed on *Phalænopsis Stuartiana*, *P. Schilleriana*, and *P. deliciosa*; of the observed instances, the proliferation has occurred most frequently in the first named species, of which a specimen with a miniature plant on one of its roots, and having two tiny leaves, was brought under the notice of the Orchid Conference at South Kensington, in May, 1885; a similar growth has been observed on the roots of *P*, *Schilleriana*; the observed case in *P. deliciosa*, a species that is no longer in cultivation, at least in Great Britain, rests on the authority of the late Professor Reichenbach, who mentioned it in one of his communications to the Orchid Conference.* We find no record of proliferation occurring on the roots of any other species of Phalænopsis, but the phenomenon has been noticed in other genera, in Cyrtopodium, in Saccolabium,† and especially in our native Birds' Nest orchid, *Neottia Nidus-avis*, which was observed by Dean Herbert so long ago as 1833,‡ by Vaucher, a German botanist, in 1841, and subsequently by others.

Proliferation of the peduncle is a more frequent occurrence; it always takes place at one of the nodes, usually that immediately below the lowermost flowers when the inflorescence is racemose, or as before the lowermost branch when paniculate.§ Many of the species of Phalænopsis in cultivation produce proliferous peduncles, but the range of observation has been too restricted, and the recorded instances too few to admit of the formulating of any general law that pervades the phenomenon. Moreover the cultivators of these choice plants, as a rule, cut off the peduncles as soon as the flowering is over, as their retention on the plant would greatly weaken it, either by proliferation, or by continuous flowering, and even cause it to perish. The most frequently observed causes of proliferation of the peduncle have occurred in *Phalænopsis Lüddemanniana*, *P. Schilleriana*, *P. Stuartiana*, less frequently in *P. rosea*, *P. Aphrodite*, *P. intermedia*. The most common case of successive branching of the peduncle after the first flowers have fallen occurs in *P. amabilis*.||

Phalænopsis affords a conspicuous example of the rapid enlargement of a genus through the activity of the orchid collectors of the present time in searching out new species and varieties, and through the further multiplication of forms by the skill of the hybridist in the glass houses of Europe. Only one species was known to Linnæus, which was an herbarium specimen sent to him by Osbeck, and to which he gave the name of *Epidendrum amabile* (1753), (*Phalænopsis amabilis*, Bl.), and this was the only one known to science for nearly a whole century, till Cuming discovered a

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* Report of the Orchid Conference in the Journal of the Royal Horticultural Society p. 18. † Idem.

‡ Magazine of Botany and Gardening, *fide* A. D. Webster in Gard. Chron. XXIII. (1885), p. 769.

§ See fig. in Gard. Chron. IV. s. 3 (1888), p. 389.

|| Proliferation of the peduncle in other genera have been observed in *Oncidium abortivum* by Mr. Swan (Gard. Chron. II. s. 3 (1887), p. 554); in *Angræcum Leonis* by another correspondent (Id. IV. s. 3 (1888), p. 515); and in *Phaius grandifolius* after the stem had been cut off and thrown under the stage (Idem).

second species in the Philippine Islands in 1838, which by an unfortunate error Dr. Lindley referred to the *P. amabilis* of Blume, but from which it is clearly distinct. Ten years later a third species, *P. rosea,* was sent to our Exeter firm from the Philippine Islands by Thomas Lobb, who also sent with it *P. intermedia,* since proved to be a natural hybrid between *P. Aphrodite,* Cuming's discovery, and *P. rosea.* During the next fourteen years the number of species from various sources had increased to eleven, up to the time when the genus was monographed by Reichenbach in the first part of his *Xenia Orchidacea II.,* which he published in 1862. Twenty years later, when revising the ORCHIDEÆ for the *Genera Plantarum,* Mr. Bentham estimated the number of species at fifteen, but so rapidly were additions made between 1875—85, that Mr. Rolfe enumerates thirty-four species in his revision of the genus published in the *Gardeners' Chronicle* in 1886; but as this number includes three or four that must be reduced to varieties or synonyms of other species, and one or two others that are undoubted natural hybrids, the actual number of known species may be fairly estimated at about thirty, two-thirds of which are in cultivation.

Mr. Bentham admitted but two sectional divisions, which are thus distinguished :—

EUPHALÆNOPSIS. Petals much broader than the sepals, and contracted at the base; lip with two antennæ-like appendages at the apex, but which are sometimes reduced to small teeth.

The included species are *amabilis, Aphrodite, Sanderiana, Schilleriana, Stuartiana,* and the hybrids in the parentage of which these species have participated.

STAUROGLOTTIS. Petals equal to, rarely smaller than the sepals; the middle lobe of the lip entire,* without the apical appendages of EUPHALÆNOPSIS.

This section includes *amethystina, Boxalli, Cornu-cervi, Lüddemanniana, Mannii, maculata, Mariæ, Parishii, rosea, speciosa, sumatrana, tetraspis, violacea* and others known to science but not in cultivation.

Besides those enumerated above, there are two other interesting species in cultivation that cannot properly be included in either section, viz., *Phalænopsis Lowii* and *P. Esmeralda.* Mr. Bentham included the first named in EUPHALÆNOPSIS, but it differs from all the species in that section in two important characters, viz., the absence of the apical

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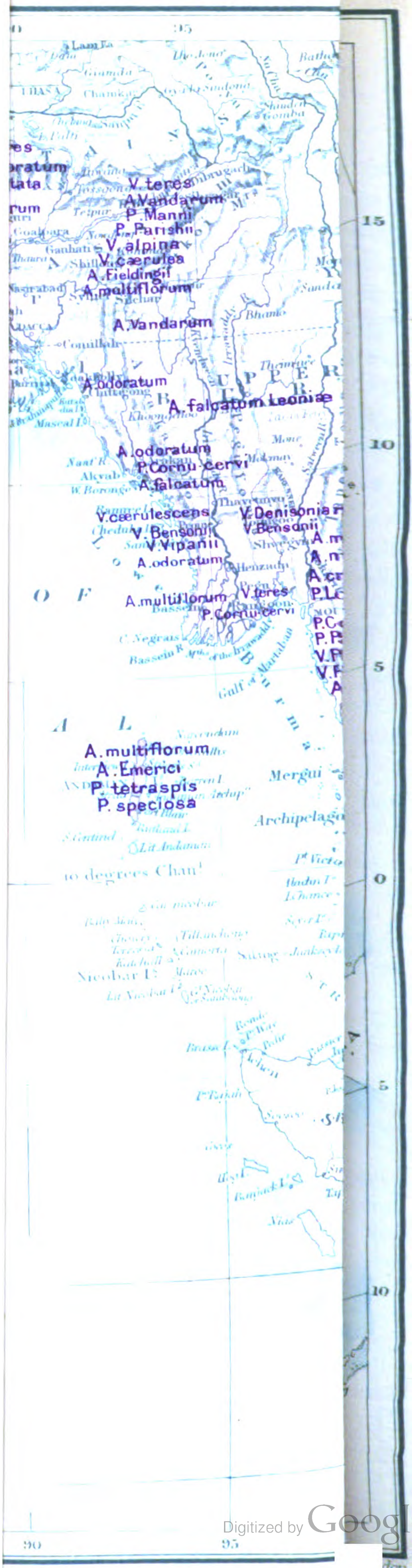
* In three species notched at the apex, *fide* Rolfe in Gard. Chron. XXVI. (1886), p. 276.



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W. Boronga
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Banjak I.
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B u r m a
V. teres
A. Vandarum
P. Manni
P. Parishii
V. alpina
V. caerulea
A. Fieldingii
A. multiflorum
A. Vandarum
A. odoratum
A. falcatum Leoniae
A. odoratum
P. Cornu-cervi
A. falcatum
V. caerulescens
V. Bensonii
V. Vipanii
A. odoratum
A. multiflorum
V. Denisonia
V. Bensonii
V. teres
P. Cornu-cervi
A. multiflorum
A. Emerici
P. tetraspis
P. speciosa

appendages of the lip, and in having a curious proboscis-like rostellum; moreover its leaves are deciduous in its native home, and generally so under cultivation in the glass houses of Europe. *P. Esmeralda*, which would otherwise be included in STAUROGLOTTIS, is singular in having a pair of slender linear appendages on the claw of the labellum. To meet these obvious deviations from the other sectional types Mr. Rolfe has proposed two new sections for their reception, PROBOSCIDIOIDES for *P. Lowii*, in reference to the curious elephant's-trunk-like appendage of its column, and ESMERALDA for the species of that name.*

The generic name Phalænopsis is derived from φάλαινα (phalaina), "a moth," and ὄψις (opsis), "the appearance." It seems to have been suggested to the Dutch botanist, Blume, by the fancied resemblance of the flowers of *Phalænopsis amabilis* (*P. grandiflora*, Lindl.), the species upon which the genus was founded, to some of the tropical moths while on the wing, in the same manner that our native species of Ophrys have received the popular names of Fly Orchis, Bee Orchis, Spider Orchis, etc., from the supposed resemblance of their flowers to those familiar insects.

Geographical Distribution. — The geographical distribution of the species of Phalænopsis will be best understood from an inspection of the accompanying map, on which are inscribed the names of all the species whose habitats are known. By far the greater number of these are insular, and the few that occur on the mainland of the Asiatic continent are, with two exceptions, natives of the south-eastern peninsula, and are always found at no great distance from the sea shore. All the species included in the section EUPHALÆNOPSIS are natives of the Philippine Islands, except the type, *Phalænopsis amabilis*, which has a wide range in the Malay Archipelago. On the mainland one species occurs in Cochin China, two in Moulmein, one, *P. Cornu-cervi*, in the delta of the Irawaddy, and thence southwards as far as Java and other islands in the Malay Archipelago, and one, *P. Mannii*, an outlying member of the genus, is found in Assam, living under different climatic conditions and environment from all its congeners.† With the exception of the last-named species, it is thence seen that the genus is spread over a region lying between the 15th parallel of north and the 8th parallel of south latitude, and between the 95th and 125th meridians of east longitude, and therefore within what is geographically termed the equatorial zone. We have already described in some detail, under Dendrobium, the climatic phenomena of this zone, the most salient characteristics of which may be conveniently repeated here, since, under similar conditions, most of the species of Vanda, Aërides, and other members of the sub-tribe SARCANTHEÆ live, notably those species that are in high estimation amongst cultivators of orchids.

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* Gard. Chron. XXVI. (1886), p. 276.

† A sub-variety of *Phalænopsis Parishii* also occurs in Assam, but not in the same locality as *P. Mannii*.

The temperature of the equatorial zone is remarkable for its uniformity throughout the year, the extreme range of the thermometer from the lowest to the highest, at Batavia for example, rarely if ever exceeding 15° C. (27° F.), while at other stations it is considerably less. The highest day temperature is usually 33°—35° C. (90°—95° F.), while it seldom falls below 21°—24° C. (70°—75° F.) at night, the coolest hours being just before sun-rise. The annual rainfall is modified by local circumstances; in the Malay Archipelago and the southern Philippines it ranges from 80 to 90 inches; in these islands the atmosphere is nearly always saturated with moisture, and, owing to the great weight of vapour which its high temperature enables it to hold in suspension, a very slight fall in the thermometer is accompanied by the condensation of a large absolute quantity of atmospheric vapour, so that copious dews and heavy showers of rain are produced at comparatively high temperatures and low altitudes.* In Moulmein the annual rainfall is much greater than in the Malay Archipelago, and is distributed over ten months of the year, the remaining two months, from about the middle of January to the middle of March, being rainless; in the Andaman Islands, which are still nearer the equator, the dry season rarely exceeds four or five weeks; in Cochin China the climatic phenomena approach those of the Malay Archipelago, except that there is a decidedly dry season of about two months' duration. Within the equatorial zone the sea and land breezes are among the most prevalent and constant of the aërial currents, and within their influence nearly all the finest species of Phalænopsis live. The northern Philippines, Moulmein, and southern Burmah being within the sphere of the monsoons, the atmospheric disturbances in those countries are more violent at certain seasons of the year.

Cultural Note.—The introduction of species of Phalænopsis from the neighbourhood of the equator to the high latitude of Great Britain, to be cultivated in artificially heated glass houses, has been one of the most difficult cultural problems horticulturists have been called upon to solve The most accurate knowledge of the environment of the species in their native home affords, at best, but a subordinate aid to the solution of that problem, for an attempt to imitate the conditions under which they grow wild would simply prove impracticable, apart from the great difference in the climatic phenomena of places situated in latitudes so far removed from our own. A few instances quoted from authentic sources will make this clear. In north Borneo, *Phalænopsis amabilis* (*P. grandiflora*, Lindl.) grows high up on trees screened from the sun by a leafy canopy, deluged with rain for more than half the year, and constantly fanned by cool sea breezes.* In strong contrast to this, *P. Lowii* grows on limestone rocks that rise suddenly out of the delta of the rivers Gyne, Ataran, and others in Tenasserim, where the country surrounding these hills is under water the greater part of the year, and where, during the dry season, the plants are literally scorched, nothing remaining but the roots.† Again, in contrast to both the preceding cases, *P. tetraspis* grows suspended from the branches of Mangrove trees, a few feet above water along the swampy shores of the Andaman Islands; ‡ and *P. Stuartiana* has been observed on the coast of Mindanao, growing on the branches of trees so close to the sea that it can scarcely fail to be washed by the salt spray during a storm. It is thence evident that the conditions under which Phalænopses can be grown successfully in this country can only be ascertained from experiment and from observations, extended over a long period, of the behaviour of the plants under the altered circumstances in which they are placed. The experiments, at first necessarily of an empirical character, have now extended over more than half a century, and the results derived from them may be fairly reckoned among the best achievements of the horticultural skill of the present day, for Phalænopsis may now be said to be firmly established in European gardens.

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* Wallace's *Tropical Nature*, p. 15.

It will be directly inferred from the geographical distribution of the genus that the Phalænopses require a higher average temperature than the majority of the cultivated orchids, and to meet this requirement a separate house or compartment of a house is, when practicable, especially devoted to them. A low-pitched house is almost invariably preferred, but in the constructive details much diversity prevails, one cultivator preferring one kind of arrangement, another another kind, each affording some advantages that secure for it a preference. The most prominent instance of the successful cultivation of these plants known to us is at Tring Park, the seat of the Right Honourable Lord Rothschild; a general description of the house in which they are grown will thence serve better than any form of construction that we can suggest. The Phalænopsis house at Tring Park is a half-span, and being the inner division of a long range facing south, no cold air from the opening of outer doors can enter it. The floor is 2 feet below the surface of the ground, and there are front and back beds covered with slate slabs; the front bed for the smaller plants averages 2½ feet from the roof-glass, the back bed for the specimen plants averages 4½ feet from the roof. The house is heated principally by hot-water pipes in the pathway, and by two 4-inch pipes in each of the covered beds; in addition to these there are two 1-inch hot-water pipes both along the front and along the back, placed as near the roof as possible. Ample ventilation is provided for along the whole length at top; the shading is effected by means of a roller blind, and on hot, bright days with the addition of an upright canvas screen 10 feet high, placed immediately in front of the house, and which can be set up and removed at pleasure. The plants are for the most part cultivated in upright teak cylinders, the potting material being that described *infra.* Many of them have been thus cultivated for ten years, and have not only flowered in a satisfactory manner, but have greatly increased in size.

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* Burbidge, *Gardens of the Sun*, p. 52.

† Major-Gen. E. S. Berkeley in Gard. Chron. I. s. 3 (1887), p. 280.

‡ Idem. II. s. 3 p. 74.

The cultural routine practised by the most experienced growers of Phalænopsis may be thus formulated:—

Temperature.—Phalænopses usually commence their season's growth in March, at which time the temperature of the house should be gradually raised till the end of April, when the night temperature should not be allowed to sink below 21° C. (70° F.), and the day temperature should range from 24°—27° C. (75°—80° F.), according to the brightness of the weather. These temperatures should be maintained till the middle of November, from which time they should be gradually diminished up to the end of the year, when the plants enter upon their resting season, which continues till about the end of March. During this season, the night temperature should range from 15°—18° C. (60°—65° F.), according to the state of the weather, raised in the daytime to 18°—21° C. (65°—70° F.), or even a little higher on bright days.

Watering.—This must be regulated according to the season, as Phalænopses grow naturally in an atmosphere that is nearly always saturated with vapour. The humidity of the house during the growing season must be maintained to near the saturation point; this is effected chiefly by "damping down," that is to say, by sprinkling with water all the available surface within the house from which it will evaporate freely, as the floors, side-walls, stages, etc.; this should be performed at least three times a day in sultry weather. During the winter months the "damping down" may be restricted to once a day, or so often as is sufficient to counteract the drying effect of the hot-water pipes, and no more water should be applied direct to the plants than is sufficient to keep the surface sphagnum alive and moist. When water is applied direct, it should be poured on the sphagnum only, never on the foliage of the plants.

Ventilation and Shading.—No very precise directions can be given for ventilating the Phalænopsis-house. Air should be admitted during the growing season, whenever the external temperature is sufficiently high to allow of its being done without risk; this is best effected by means of the lower ventilators, which should always be placed close to the hot-water pipes, that the air may be warmed by them during its ingress. The necessity for providing as much ventilation as is practicable, where so high a temperature has to be constantly maintained, is one of the most serious cares of the cultivator. The shading of the house, too, requires unceasing vigilance, especially during the growing season, when the sensibility of the leaves to direct sunlight is most apparent, for if exposed to it but for a short time when the sun is powerful, they soon lose their rich glossy colouring, and get a scorched, unhealthy appearance from which they seldom recover.* Generally speaking, shading must be regulated according to the season and the brightness of the weather. During the winter months little or no shading is necessary.

Potting, etc.—Phalænopsis may be grown in pots, baskets, or cylinders made of teak-wood rods, or even on blocks of wood and rafts. Baskets and cylinders made of stoutish rods are preferred by many cultivators for the species of EUPHALÆNOPSIS, as their roots can thence cling to the rods in the same way as they cling to the bark of trees in their native home; but they are not free from objections, the greatest of which is that as soon as the wood begins to decay the roots of the plants will not cling to it. For species of the section STAUROGLOTTIS, which are mostly of smaller size, the pot, basket, or cylinder should be filled to three-fourths of its depth with clean, broken crocks for drainage, and on the top of these many cultivators place horizontally some straight pieces of charcoal; but we have long discontinued the use of this substance from our inability to detect the slightest advantage derived from it. The remaining space should be filled with living sphagnum, and the plant placed in the centre, raised above the level of the rim by means of the sphagnum, and some smaller broken crocks mixed with it to promote drainage. It is usual to suspend the basket from the roof.

Should the atmosphere of the Phalænopsis-house be allowed to get dry, thrips will multiply with great rapidity, and soon disfigure the foliage of the plants; the washing of the leaves with a sponge dipped in tepid water is an efficacious remedy that should be used as often as thrips are detected. A moderate fumigation may also be used with good results, provided the operation is performed when the foliage is dry. The house should be fumigated towards evening, and again on the following morning before it is "damped down." Cockroaches occasionally gnaw through the thick roots of vigorous-growing specimens, and should be got rid of. Slugs lurk in the fresh sphagnum, and grow with surprising rapidity, and with corresponding voracity; they should be assiduously sought for and destroyed, as the mischief they do is sometimes irreparable.

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* "The robust growth of *Phalænopsis amabilis (P. grandiflora*, Lindl.) astonishes all who see the plant growing in its native habitat for the first time, and how tightly the plants are lashed upon the trunk or branch on which they grow. Here, high up in mid-air and under a fierce sun. all the leaves are occasionally scorched off, or dried off by sun and wind during an exceptionally dry monsoon; but the plant's energy still lives in its roots, which, securely lashed to the bark of trees, remain firm and strong, and no sooner does the wet season arrive than leaves and flowers are produced as if by magic."—F. W. B. in *The Garden, XXIV.* (1883), p. 560.

SYNOPSIS OF SPECIES AND VARIETIES.

Phalænopsis amabilis.

Leaves broadly obovate-oblong, 6—12 inches long, sometimes attaining greater dimensions under cultivation, the smaller leaves emarginate, the larger ones mucronate. Peduncles of variable length, green tinged with dull purple, ascending or arching, panicled, but sometimes racemed, many-flowered. Flowers 3—4 inches across the petals; sepals and petals white, the dorsal sepal elliptic-oblong, the lateral two lanceolate-oblong, oblique; petals very broad, sub-rhomboidal, contracted at the base; lip three-lobed, the side lobes incurved towards the column, clawed, sub-quadrate, rounded on the apical sides, yellow at the base, spotted with red on the claw; the front lobe linear-hastate, with two basal auricles and two long apical tendrils, curled inwards; crest two-lobed, yellow spotted with red. Column short, sub-clavate.

Phalænopsis amabilis, Blume, Bijdr. p. 294, t. 44 (1825). Id. *Rumphia, IV.* t. 194 and 199. Lindl. Gen. et Sp. Orch. p. 213 (1832.) P. grandiflora, Lindl. in Gard. Chron. 1848, p. 39, icon. xyl. *Bot. Mag.* t. 5184. De Puydt, *Les. Orch.* t. 34. Williams' *Orch. Alb. VI.* t. 277. Epidendrum amabile, L. Sp. Pl. ed. I. p. 953 (1753). Cymbidium amabile, Roxb. Fl. Ind. III. p. 457 (1832).

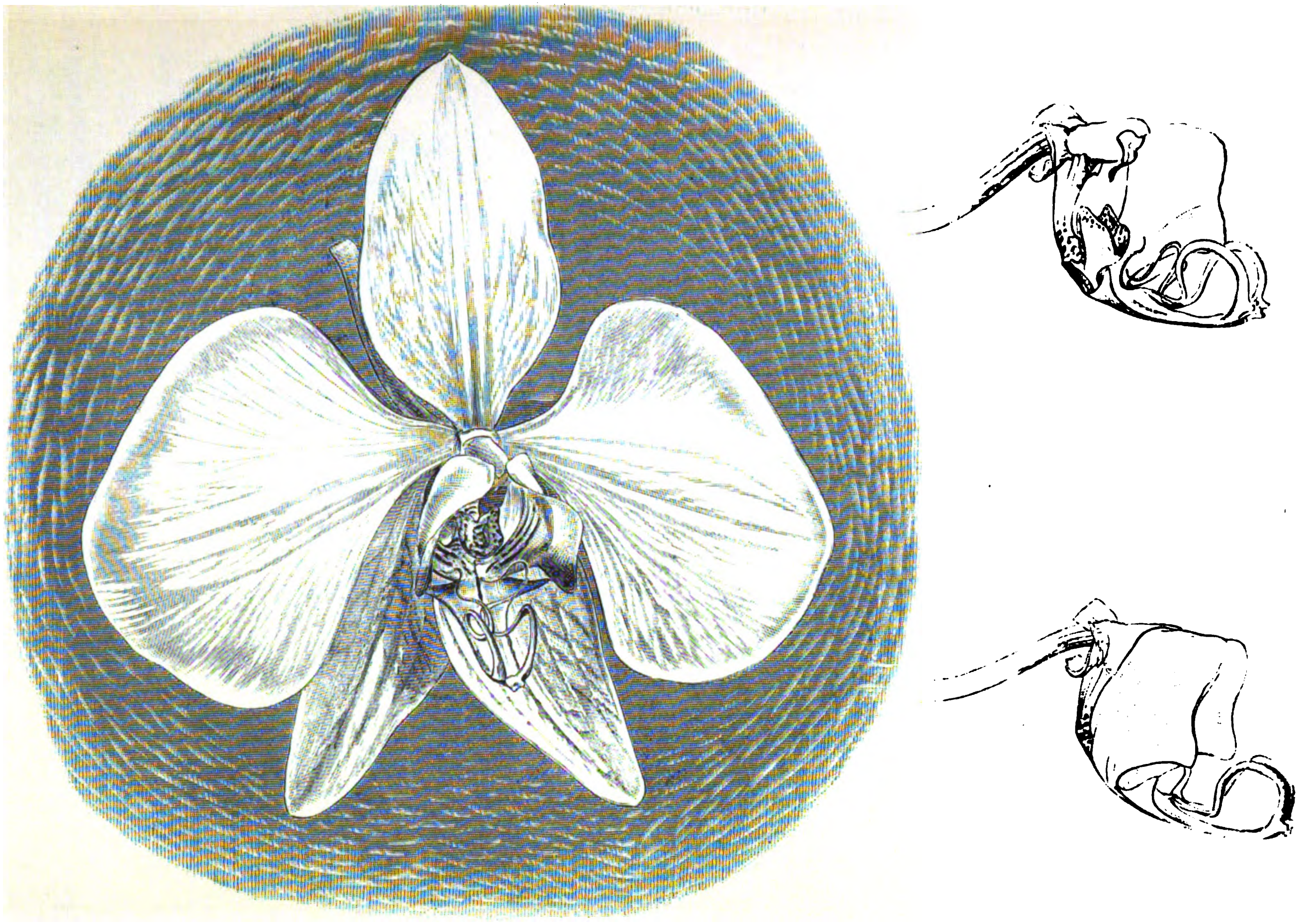
var.—aurea.

Peduncles greenish yellow. Flowers usually larger than the typical form, with broader sepals and petals; the front half of the lateral lobes of the lip, with the entire front lobe, including the cirri, light yellow.

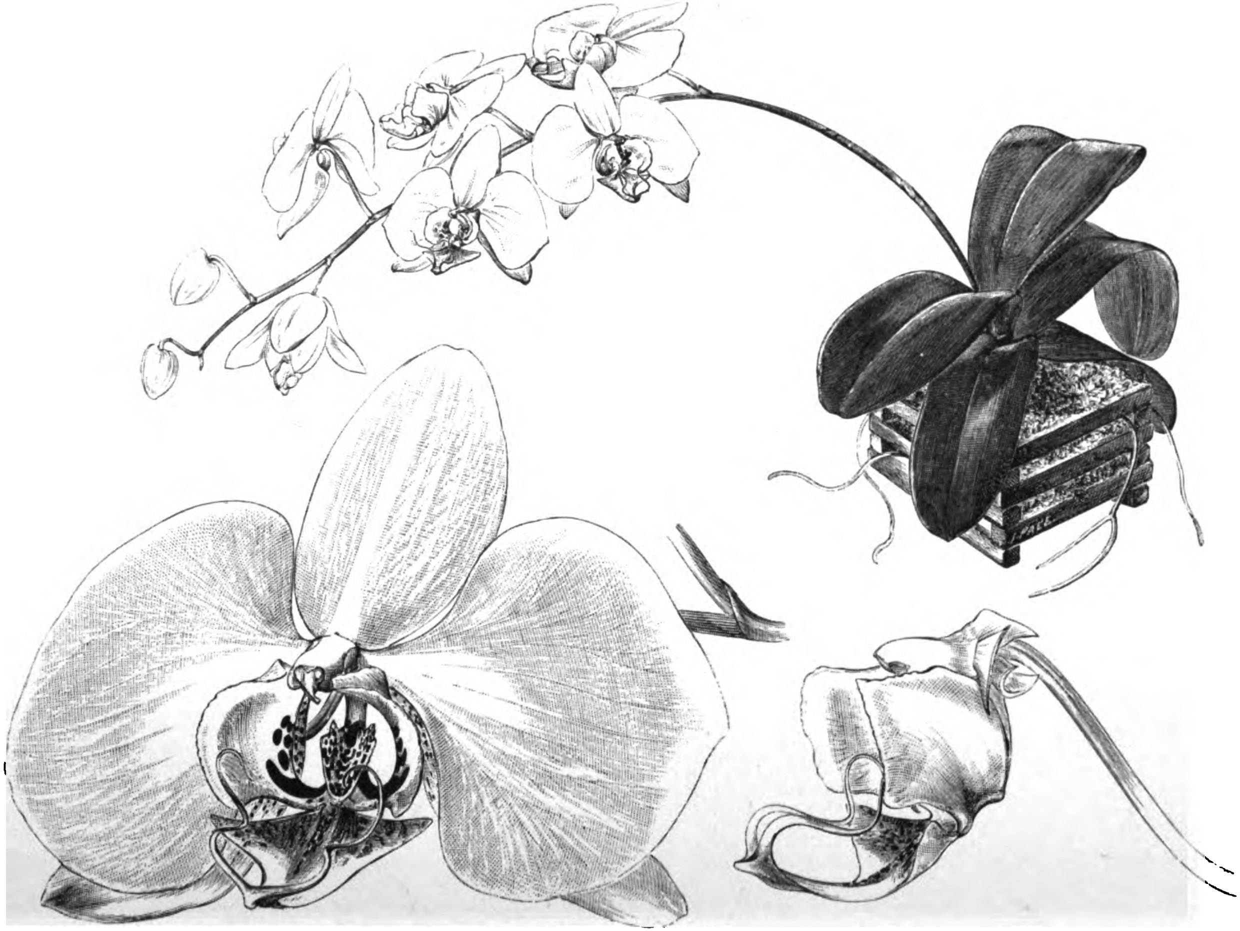
P. amabilis aurea, Rolfe in Gard. Chron. XXVI. (1886), p. 212. P. grandiflora aurea, Warner's *Sel. Orch. II.* t. 7. Sander's *Reichenbachia I.* t. 11.

The botanical history of this lovely orchid is sketched by Mr. R. A. Rolfe in the second volume of the *Gardeners' Chronicle* of 1886, p. 168, from which we extract the following:—

It appears to have been first discovered in the island of Amboina, by Rumphius, who gave a description and figure of it under the name of *Angræcum album majus,* in his *Herbarium amboinense,* which



Phalænopsis amabilis.



Phalænopsis Aphrodite.

he published in 1750. Two years later it was detected by Osbeck, on New Island, at the western extremity of Java, and specimens preserved by him were sent to Linnæus, who described the plant in the first edition of his *Species Plantarum*, published in 1753, under the name of *Epidendrum amabile.** In 1798 it was introduced from the Moluccas to the East India Company's botanic garden at Calcutta, as we are informed by Dr. Roxburgh, who, when compiling his *Flora indica*, published many years later, removed it from Epidendrum and placed it under Swartz's genus, Cymbidium, to which it is much more nearly allied. We next hear of it through Dr. Horsfield, who found it in 1809 in the district of Patjitan, on the south coast of Java, and again some years later, through Dr. Blume, who detected it on the small island of Nusa Kambangau, and who founded upon it the genus Phalænopsis, which he published in 1825; in that genus it is doubtless destined to remain.

The merit of introducing *Phalænopsis amabilis* to British gardens is due to Thomas Lobb, who sent plants from Java to our Exeter firm in 1846; it flowered for the first time in this country in September of the following year, in the collection of Mr. J. H. Schroeder, at Stratford Green, on which occasion it received the name of *Phalænopsis grandiflora* from Dr. Lindley, a name that cannot be retained, for reasons stated under *P. Aphrodite, infra.* Since its introduction by Lobb, *P. amabilis* has been gathered in various parts of the great Malayan Archipelago. All the collectors sent out by our firm into that region mention it, and all agree in reporting that it is found close to the sea-shore, sometimes high up on the trunks of lofty trees, sometimes much lower down, even in positions where it was scarcely beyond the reach of the salt spray. Burbidge found it in Labuan and north Borneo, and noticed that the Bornean differed from the Java form in its thinner leaves, less vigorous growth, and in the other characters described above under the variety *aurea.* Curtis detected it in north Celebes, where its flowers are smaller than the Java form; and Burke met with a small-flowered variety in south-east New Guinea, growing on the thick aërial roots of the Screw-pine (Pandanus). The geographical distribution of *P. amabilis* is therefore very extensive; it is, so far as at present known, the most widely distributed of all the species of EUPHALÆNOPSIS.

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* The type specimen sent by Osbeck to Linnæus is still in an excellent state of preservation in the Linnean Herbarium at Burlington House. For an inspection of this most interesting specimen we are indebted to the courtesy of the officers of the Linnean Society.

P. amethystina.

Roots flattened towards the apex. Leaves oblong-cuneate, 3—4 inches long., 1—1½ inch broad. Peduncles simple or branched, longer than the leaves, few-flowered. Flowers comparatively small; sepals and petals white, the former obovate-oblong, the lateral two adnate at their base to the foot of the column, the petals a little smaller than the sepals, oblong-spathulate; lip bright amethyst-purple, striated and margined with white, three-lobed, the side lobes spathulate-oblong, the apical margin denticulate, the front lobe shortly clawed, broadly obcordate, with a semi-lunar sinus in the anterior margin; crest with two divergent teeth. Column short, anther beaked.

Phalænopsis amethystina, Rchb. in Gard. Chron. 1865, p. 602. Id. 1870, p. 1731, icon. xyl.

Vaguely stated to be of Sundaic origin, probably Java or Sumatra. It flowered in the collection of Mr. C. Stead, at The Knoll, near Leeds, in 1870, and in the Royal Gardens at Kew, in November, 1888 and following years. It is a dwarf, elegant little plant, flowering in the late autumn. We are indebted to the Royal Gardens at Kew for materials for description.

P. Aphrodite.

Leaves elliptic-oblong, variable in size, 8—15 inches long, 2—3½ inches broad, of a uniform deep green above, purplish beneath. Peduncles 2—3 feet long, arching, green mottled with dark purple, sometimes racemed, sometimes loosely panicled, many flowered. Flowers 2½—3½ inches across the petals; sepals and petals white, the upper sepal oblong, obtuse, the lateral sepals ovate-falcate, acute, keeled behind; petals rhomboidal, as broad again as the sepals; lip three-lobed, the claw and basal area of the side lobes pencilled and spotted with purple and with a pale yellow stain on each side; the side lobes clawed, broadly oval, ascending and incurved; the front lobe hastate with very acute basal angles, and bearing at the apex two long recurved crumpled cirri; crest bi-lobate, the lobes toothed at the apical end, yellow spotted with red. Column short, terete, white; anther beaked.

Phalænopsis Aphrodite, Rchb. in Hamb. Zeit. 1862, p. 35. Id. Xen. Orch. II. p. 6. Rolfe in Gard. Chron. XXVI. (1886), p. 212. P. amabilis, Lindl. (not Blume) in *Bot. Reg.* 1838, t. 34. Paxt. *Mag. Bot. VII.* p. 49 (1840). Van Houtte's *Fl. des Serres, I.* t. 36. *Bot. Mag.* t. 4297.

var.—Dayana.

The purple markings of the lip extend over a greater area, including the front lobe, which has a broad median, and marginal lines of the same colour.

P. Aphrodite Dayana, supra. P. amabilis Dayana, Williams' *Orch. Alb. I.* t. 11 (1882).

var.—gloriosa.

Differs but little from the variety *Dayana*, except that the leaves are of a lighter green, the red on the front lobe of the lip more diffused, and its claw white.

P. Aphrodite gloriosa, supra. P. gloriosa, Rchb. in Gard. Chron. III. s. 3 (1888), p. 554. *The Garden, XXXV.* (1889), t. 697.

This Phalænopsis was first sent from Manila, by Cuming, in 1837, to Messrs. Rollisson—one plant only surviving the voyage—in whose nursery at Tooting it flowered in the autumn of that year, and was figured by Dr. Lindley in the *Botanical Register*, under the name of *Phalænopsis amabilis*, in the erroneous belief that it was the same species as that upon which Blume had founded the genus thirteen years previously, but which was not then in cultivation. And when in 1847 the true *P. amabilis*, of Blume, was sent to our Exeter firm by Thomas Lobb, Dr. Lindley, although recognising it as distinct from the *P. amabilis* figured in the *Botanical Register*, failed to correct the mistake he had fallen into respecting the Manila plant, and gave the name of *P. grandiflora* to Lobb's introduction. Through this unfortunate error, the substitution of *grandiflora* for the true *amabilis* has been perpetuated to the present time, notwithstanding that Reichenbach had noted and corrected it so long ago as 1862.[*] A comparison of the accompanying woodcuts of the two species shows that they differ essentially in the form of the labellum, and also in some minor particulars; *P. Aphrodite* is further distinguished from *P. amabilis* by the deeper glossy green of its leaves, that are also purplish beneath.

In its native home *Phalænopsis Aphrodite* is spread generally over the islands of Luzon, Mindoro, and the adjacent small islands; and although the inroads made upon it by collectors have resulted in the removal of an immense number of plants in the aggregate, it is still abundant in those localities.

The two varieties described above, which were introduced by Messrs. Low and Co., differ but little from each other; *Dayana* appeared many years ago in the collection of the late Mr. John Day, at Tottenham; *gloriosa* is a comparatively recent introduction.

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[*] Xen. Orch. Orch. II. p. 6. The error has since been repeatedly pointed out by the late Professor Reichenbach in Gard. Chron. *passim*, notably in III. (1875) p. 302, sub. *P. leucorhoda*; also by Van Houtte in Fl. des Serres, sub. P. Lüddemanniana, t. 1636; by Mr. Nicholson in *Dictionary of Gardening, III.* p. 92; by Mr. R. A. Rolfe, in Gard. Chron. V. s. 3 (1889), p. 88.

The specific name, *Aphrodite,* is mythological, and is the Greek name of the goddess Venus, selected doubtless on account of the great beauty of the flowers.

P. Boxalli.

Leaves ovate-oblong, 5—6 inches long. Peduncles terete, stoutish, as long as or longer than the leaves, racemose, 9—12 flowered. Flowers 1½ inches in diameter, on slender whitish pedicels sheathed at the base by a small, acute, green bract; sepals lanceolate, acute, yellow blotched and barred transversely with red-brown; petals shorter and narrower than the sepals, linear-oblanceolate; lip of very complex structure; in front of the short claw are two reflexed, oblong, whitish plates, representing the side lobes, each having a cirrus or bristle on the anterior side; the front lobe is anchor-shaped, with a pale yellow fleshy plate, having a purple tooth near its base. Column clavate, with a small rounded wing on each side of the stigma, reddish brown towards the base, yellow above.

Phalænopsis Boxalli, Rchb. in Gard. Chron. XIX. (1883), p. 274.

Introduced in 1882, by Messrs. Low and Co., from the Philippine Islands, through their collector, Boxall; it belongs to the section Stauroglottis, its nearest affinities being *Phalænopsis Cornu-cervi* and *P. Mannii.* We are indebted to Baron Schroeder, of The Dell, Staines, for materials for description.

P. Cornu-cervi.

Leaves oblong, or ovate-oblong, sub-acute, cuneate at base, leathery, bright glossy green. Peduncles sub-erect or nodding, racemose along the distal half, the rachis broad and compressed, 7—12 flowered. Flowers 1½—2 inches in diameter, expanding in succession from below upwards, three to five being open at one time; sepals and petals spreading, elliptic-oblong, acute, yellow-green barred and blotched with red-brown, the petals a little narrower than the sepals, and the lateral sepals partially falcate, keeled behind; lip shorter than the other segments, white, clawed, three-lobed, the side lobes oblong, erect, the front lobe crescent-shaped, hollow, with an awned callus at the base. Column semi-terete, with two tubercles at the base.

Phalænopsis Cornu-cervi, Blume et Rchb. in Hamb. Gartenz, 1860, p. 116. Hook. f. Fl. Brit. Ind. VI. p. 29. Polychilos Cornu-cervi, Kuhl et Hasselt, Orch. jav. ed Breda, t. 1 (1827). Lindley, Fol. Orch. Polychilos, No. 1 (1853). Miquel, Fl. ind. bat. III. p. 681. *Bot. Mag.* t. 5570.

The following interesting account of the geographical distribution of *Phalænopsis Cornu-cervi* and its environment *in situ,* communicated to the *Gardeners' Chronicle* by Major-General E. S. Berkeley, affords at least one phase of orchid life in a tropical jungle, of which we still know too little:—

"This curious orchid is found in abundance on the stunted bushes in the swampy islands at the mouth of the river Irawaddy. In this situation, being exposed to the sun during the dry season, it loses its leaves, its roots being kept plump by the night dews, and it consequently has a distinct resting season. When growing in the shade it has no resting season, loses none of its leaves, and continues in flower throughout the year.

"*Phalænopsis Cornu-cervi* is found from Akyab (lat. 19° N.) throughout the whole of Lower Burmah, and southwards down to Tavoy, Mergui, and Perak, also in Java, occasionally on the hills, abounding in the plains, flourishing luxuriantly in the dense shade of the forest, where it is protected from dry winds. In 1870 the Bamboos in the jungle between Pegu and Shoagun flowered, and, as is the habit of many Bamboos, the clumps died and rotted down, thus rendering it possible to penetrate into a forest which had been closed for years. The few scattered trees growing in the Bamboo jungle were Mango trees; the trunks of these trees were found covered with huge masses of *P. Cornu-cervi*, growing in the densest shade, where they had been unmolested for many years. The plants presented masses of leaf growth of extraordinary vigour, and bore such quantities of flowers as would delight an English orchidist; this was the solitary orchid found in this shady forest. Unfortunately, the deciduous variety, which bears comparatively very poor flowers, is that which survives the journey to England, the large evergreen form found in the jungle being too soft to travel."

Besides the localities indicated in the foregoing extract, our collectors Curtis and Burke detected this orchid growing on trees on the limestone hills of Saràwak. They noted that in this district the flowers are variable in colour, some being prettily marked, while the majority are pallid and inattractive.

The specific name, *Cornu-cervi*, is literally "stag's horn," suggested probably by the flattened rachis of the inflorescence.

P. Esmeralda.

Roots stoutish, white, radiating on all sides from the base of the short stems. Leaves oblong or elliptic-oblong, acute, 5—8 inches long. Peduncles usually deep green, but sometimes spotted with blackish purple, slender, erect, 15—20 or more inches high, racemose along the distal half, many flowered. Flowers about an inch in diameter, on short pedicels spirally arranged round the rachis; sepals and petals varying in colour in different plants from amethyst-purple to pale lilac or almost white, the dorsal sepal and petals oval-oblong, acute; the lateral sepals ovate-oblong, and more acute than the dorsal one; lip three-lobed, the lateral lobes roundish, erect, varying in colour from deep purple to pale mauve, but sometimes orange-red and brownish red;

the intermediate lobe generally deep purple, oblong, acute, with a bi-lamellate crest, below which is an oblong disk with two cirri on the basal side. Column slender, terete above, the stigmatic cavity large, elliptic in outline; anther beaked.

Phalænopsis Esmeralda, Rchb. in Gard. Chron. II. (1874), p. 582. *Rev. hort.* 1877, t. 107. *Fl. Mag.* N.S. t. 358. Williams' *Orch. Alb. VII.* t. 321. Hook. f. Fl. Brit. Ind. VI. p. 31. P. antennifera, Rchb. in Gard. Chron. XI. (1879), p. 398. Id. XVIII. (1882), p. 520. P. Regnieriana, Rchb. in Gard. Chron. II. s. 3 (1887), p. 746. P. Buyssoniana, Rchb. in Gard. Chron. IV. s. 3 (1888), p. 295.

Introduced from Cochin China in 1874 by M. Godefroy, of Argenteuil, near Paris, who found the plant in two localities on the island of Pluquoc in the Gulf of Siam, growing on isolated rocks in the midst of a small thicket of coniferous trees; and in Cambodia, between Pursat and Phnum-Bat, also growing upon bare rocks, in no instance upon the trunks of trees. During the dry season the plants lose their leaves, and all vegetation on the rocks, on which they grow, disappears. It has since been gathered by Curtis on one of the Langkawai islands, where it grows in peat and sand at the foot of trees.

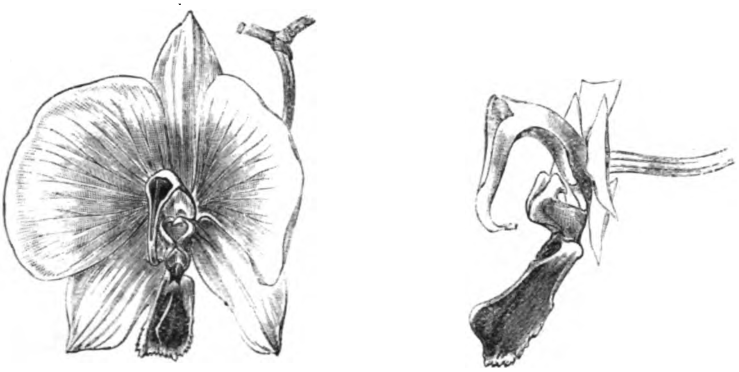
Phalænopsis Esmeralda is distinguished from every other cultivated species of Phalænopsis by its erect, many-flowered racemes, the flowers of which vary considerably in colour in different plants, and especially by the presence of two cirri at the base of the lip and not at the apex as in EUPHALÆNOPSIS, a character that separates the species both from that section and from STAUROGLOTTIS. Although the flowers are comparatively small, they are often brilliantly coloured, and being produced in the late summer and autumn months, they render the species a useful one in the orchid house at that season. The colour variations are too numerous to admit of separate notice; among them must be included the three forms quoted in our literary references that were admitted by Reichenbach to specific rank, but which we have reduced to synonyms.

P. Lowii.

Stem none, roots numerous, spreading. Leaves elliptic-oblong, 2—4 inches long, acute or emarginate, deciduous. Peduncles slender, suberect or arching, dull purple and green, 10—15 or more inches long, loosely paniculate upwards, usually few flowered, but in strong plants many flowered. Flowers 1½—2 inches in diameter; sepals elliptic-oblong with a pale purple keel behind, the lateral two with the inner margin reflexed, white with a faint flush of amethyst-purple on the basal half;

petals three times as broad as the sepals but coloured like them, sub-rhomboidal, the outer margin rotund; lip three-lobed, the side lobes erect and resembling two incurved horn-like bodies that are white with a yellow spot; the middle lobe deep purple, oblong, with two small teeth at the base and a raised mid-line that is dilated and thickened near the apex. Column curved, pale purple and convex above, concave beneath; anther with a long beak reflexed at the apex somewhat resembling an elephant's trunk.

Phalænopsis Lowii, Rchb. in Bot. Zeit. 1862, p. 214. Id. *Xen. Orch. II.* p. 139, t. 151. *Bot. Mag.* t. 5351. Warner's *Sel. Orch. II.* t. 15. Van Houtte's *Fl. des Serres, XVIII.* t. 1910. *The Garden, IX.* (1876), t. 14. Gard. Chron. II. s. 3 (1887), p. 745, icon. xyl. Hook. f. Fl. Brit. Ind. VI. p. 30. P. proboscidioides, Parish in lit. ad Low, *fide* Rchb.



Phalænopsis Lowii.

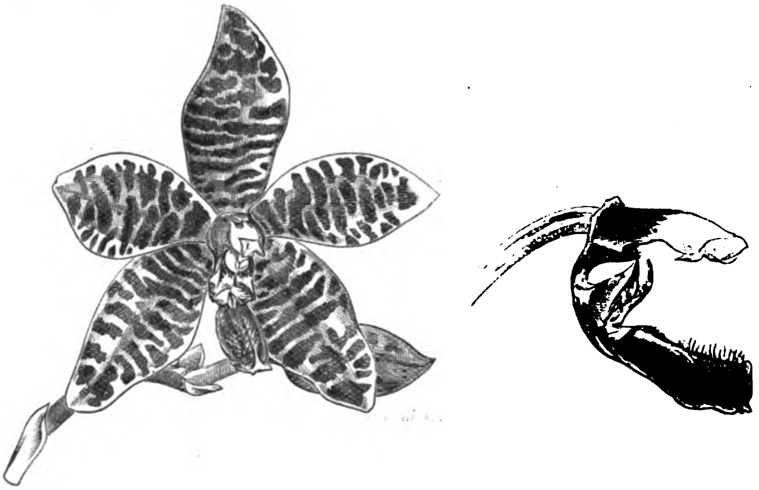
A lovely species discovered by the Rev. C. S. Parish, in Moulmein, Burmah, through whom it was introduced by Messrs. Low and Co. in 1862. Major-General E. S. Berkeley, who has seen *Phalænopsis Lowii* in its native home, writes in the *Gardeners' Chronicle* of 1887 (I. s. 3, p. 279):—

> "This plant loses all its leaves in its native habitat immediately after flowering. It grows on limestone rocks, and on the branches of small bushes growing in the crevices of the rocks. The surrounding country is under water the greater part of the year, and the rainfall is excessive; by the end of November the country dries up, and in January the flower stems and leaves have withered, nothing remaining but the roots; these cease to grow, but are kept plump by the heavy dew that falls at night. The resting season is short, as showers fall in March when the plants at once begin to put forth fresh leaves. This species grows on the north-east side of the limestone hills, and

is thence protected from the effects of the afternoon heat of a tropical sun. During the rains the limestone rocks are covered with many beautiful annual Balsams and tuberous Begonias; this will give a hint to the gardeners of the kind of moist heat required to grow *Phalænopsis Lowii* in perfection."

P. Luddemanniana.

Leaves not usually more than three—five on one plant, oblong or oval-oblong, 6—9 inches long and 2—3½ inches broad. Peduncles procumbent, as long as the leaves, 5—7 or more flowered. Flowers 2 inches in diameter; sepals and petals elliptic-oblong, the sepals chestnut-brown with some narrow, pale yellow transverse streaks and whitish margin, the basal half with a broad amethyst-purple median band; the petals smaller than the sepals, bright amethyst-purple with whitish margin and with some chestnut-brown spots towards the apex; lip clawed, three-lobed, the side lobes erect, oblong, retuse and two-toothed at the apex, white with some light purple stains, and with a bright yellow lobule in front; the intermediate lobe fleshy, obovate-oblong, keeled above, bright amethyst-purple with a pale margin, and with some erect white bristles along the keel. Column terete, white, stained with light purple, anther beaked.



Phalænopsis Lüddemanniana.

Phalænopsis Lüddemanniana, Rchb. in Mohl. et Schl. Bot. Zeit. 1865, p. 146. Id. in Gard. Chron. 1865, p. 410. *Bot. Mag.* t. 5523. Van Houtte's *Fl. des Serres*, *XVI*. t. 1635 (copied from the Bot. Mag.). *Rev. hort.* 1872, t. 390. *Florist et Pomol.* 1865, p. 257.

sub-vars.—*delicata* (Gard. Chron. 1865, p. 434), the clustered stripes on the sepals and petals narrow, the amethyst-purple confined to the very base; *hieroglyphica* (Gard. Chron. II s. 3 (1887), p. 586), sepals and petals cream-white covered with small cinnamon spots and markings; *ochracea* (Gard. Chron. 1865, p. 434), the stripes on the sepals and petals light ochre-yellow; *pulchra* (Gard. Chron. IV. (1875), p. 36), upper part of sepals and petals port-wine colour, the inferior part, as well as the lip and column, amethyst-purple, the transverse bars nearly obliterated.

Introduced by Messrs. Low and Co., in 1864, from the Philippine Islands, where it is abundant in the neighbourhood of Manila, and named in compliment to the late M. Lüddemann, a well-known orchidist of Paris, who was the first European cultivator to bring the plant into bloom. The variability in the colour of the flowers of this species has been observed from the time of its first introduction; the sub-varieties described above being among the most distinct. Our illustration represents a richly coloured form in the collection of Baron Schroeder at The Dell.

P. maculata.

A diminutive plant. Leaves elliptic-oblong, 2—4 inches long. Peduncles ascending, as long as, or longer than the leaves, few flowered. Flowers ½ — ¾ inch in diameter; sepals oval-oblong, acute, cream-white, with three—five red-brown transverse blotches; petals similar but narrower; lip fleshy, three-lobed, the lateral lobes angular, erect, white spotted with red-brown, and with a small yellow callus on the inner side; the intermediate lobe convex with a raised median line above, bright red. Column terete, white.

Phalænopsis maculata, Rchb. in Gard. Chron. XVI. (1881), p. 134.

Introduced by us in 1880, from Saràwak, in Borneo, through Curtis, who found it on the limestone hills at an altitude of 1,000—1,500 feet, growing on damp, almost bare rocks under the shade of large trees, many of which are loaded with tufts of *Phalænopsis Cornu-cervi.* It is one of the smallest of the genus.

P. Mannii.

Leaves variable in size, the largest obovate-oblong, or oblanceolate-oblong, sub-falcate acute, 6—8 inches long, 1½—2 inches broad. Peduncles as long as, or longer than the leaves, usually with two—three short branches, 10—15 or more flowered. Flowers about 2 inches across vertically; sepals and petals golden yellow barred and blotched with chestnut-brown, linear-oblong, acute with slightly reflexed margins, the lateral sepals falcately curved, the petals narrower and shorter than the sepals; lip of peculiar form and structure, shorter than the other perianth segments, three-lobed, the side lobes erect, oblong, truncate, light yellow; the front lobe also light yellow, anchor-shaped, saccate at the base, the flukes of the anchor pubescent and denticulate; in front of the side lobes is an erect, purplish tooth, and behind that is a slender upright plate terminating in two divergent cirri. Column clavate with two tooth-like protuberances at the base, golden yellow stained with red on the side opposite the lip.

Phalænopsis Mannii, Rchb. in Gard. Chron. 1871, p. 902. Hook. f. Fl. Brit. Ind. VI. p. 30.

Discovered in 1868 by Mr. Gustav Mann, a gentleman in the service of the Indian Forest Department. No locality is given with Reichenbach's description, but as the plant has since been received from Assam its habitat is thence known. So far as at present known, *Phalænopsis Mannii** is an outlying member of the genus, living at a higher altitude and under climatic conditions that differ from those under which all the other species have been found.

Cultural Note.—This Phalænopsis is successfully cultivated by Mr. Richard Maries, in his nursery at Mythop, near Lytham, Lancashire. Mr. Maries informs us that the plants are grown in baskets, with a drainage of broken crocks and charcoal, upon which sphagnum alone is placed. The baskets are suspended near the glass of a span-roofed house, exposed to the full light of the afternoon sun, where in winter the temperature is not more than 7° C. (45° F.), and even lower in very cold weather. The plants continue in flower for upwards of three months.

P. Mariæ.

Leaves deflexed, narrowly obovate-oblong, 6—10 inches long, bright glossy green. Peduncles as long as, or longer than the leaves, usually branched, few flowered. Flowers distant, 1½—2 inches in diameter, on short, slender, pale pedicels; sepals and petals similar and sub-equal, oval-oblong, obtuse, yellowish white, with 4—5 broad, chestnut-brown, transverse bands and an amethyst-purple stain at the base; lip shorter than the other segments, three-lobed, the lateral lobes narrowly oblong, erect, incurved towards the column, white with a purple stain in the middle, and a yellow lobule on the anterior side; the intermediate lobe fleshy, bright amethyst-purple, obovate-oblong, with a recurved spur at the base, keeled above, the keel clothed with white hairs. Column terete, anther beaked.

Phalænopsis Mariæ, Burbidge in lit ad nos. Williams' *Orch. Alb. II.* t. 80. *Bot. Mag.* t. 6964.

A handsome species, closely allied to *Phalænopsis Lüddemanniana* and *P. sumatrana*, first detected in 1878 by Mr. F. W. Burbidge, Superintendent of Trinity College Botanic Garden, Dublin, while travelling for us in the Malay Archipelago. He found it in Sulu, the largest of a group of small islands lying between north-east Borneo and Mindanao, growing on the hills at a considerable elevation, where it appears to be rare, as only four plants were found by its discoverer, who named the species in compliment to his wife. Some years later it was imported by Messrs. Low and Co. from the neighbouring island of Mindanao, where it is more plentiful, and where it was subsequently gathered by our collector, David Burke, on the hills near the south-east coast; in this locality it grows on the trunks and branches of trees always in dense shade, which seems essential to its well-being.

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* Perhaps not strictly isolated from all its congeners; a sub-variety of *Phalænopsis Parishii* has been gathered by Lobb, Mann, and Keenan in Assam.

P. Parishii.

A diminutive plant with flattened, fleshy roots. Leaves elliptic or elliptic-oblong, 2—4 inches long, of an uniform deep green. Racemes as long as the leaves, 5—9 flowered. Flowers ¾ inch in diameter; sepals and petals white, the dorsal sepal oblong, the lateral two broader, ovate-oblong; petals obovate; lip "with a short claw bent at right angles to the limb," three-lobed, the lateral lobes very small, horn-like, bent backwards, yellow spotted with purple; the front lobe almost triangular, bright rose-purple: crest semi-lunate with a fimbriate outer margin, white with a yellowish brown centre, below this is "a linear appendage, projecting forwards and divided to near the base into four slender filaments." Column white, spotted with purple on the anterior face.

Phalænopsis Parishii, Rchb. in Bot. Zeit. 1865, p. 146. Id. in Gard. Chron. 1865, p. 410. Id. *Xen. Orch. II.* p. 144, t. 156. Id. in Saunders' *Ref. Bot. I.* t. 85. *Bot. Mag.* t. 5815. Hook. f. Fl. Brit. Ind. VI. p. 31.

Introduced from Moulmein in 1864, by Messrs. Low and Co., through the Rev. C. S. Parish, after whom it is named. It had, however, been discovered twenty years previous to that date by our collector, Thomas Lobb, during his mission to Assam, in 1849—50, and where it has since been gathered by Mann and Keenan; the Assam plant is said to differ from the Moulmein type in the colour of the flowers, especially the labellum. In Moulmein it is generally found on the branches of trees covered with moss, where it is subject to great heat and moisture during the growing season; in the dry season it loses its leaves.* The structure of the lip of the orchid is very singular, and quite unlike that of any other species known to us; it is also motile upon the slightest pressure being applied to it,

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* Major-General E. S. Berkeley, in Gard. Chron. I. s. 3 (1887), p. 280.

P. rosea.

Leaves oval-oblong, 4—6 or more inches long, usually notched at the apex. Peduncles racemose or paniculate, ascending and pale green as far as the lowermost flower or branch; slightly zigzag, thickened, and dull purple along the rachis, which is nodding, many-flowered, continuing to lengthen and produce flowers for many weeks in succession. Flowers 1½ inches in diameter; sepals oblong, acute, white with a light rose-purple stain in the middle; petals narrowly rhomboidal, with a larger and deeper stain than on the sepals; lip three-lobed, the lateral lobes sub-spathulate, incurved, light rose-purple, with 4—5 longitudinal dark purple streaks on the inner side; the intermediate lobe shortly clawed, ovate, acute, brown at the base, the blade bright rose-purple; crest two-lobed, bright yellow spotted with red. Column terete, stained with rose-purple; anther beaked.

Phalænopsis rosea, Lindl. in Gard. Chron. 1848, p. 671. icon. xyl. Id. in Paxt. *Fl. Gard. II.* t. 72 (1852). *Bot. Mag.* t. 5212. Van Houtte's *Fl. des Serres, XVI.* t. 1645. Jennings' *Orch.* t. 27. Williams' *Orch. Alb. VI.* t. 268. P. equestris, Rchb. in Linn. XXII. p. 864 (1849). Id. Xen. Orch. II. p. 4.

var.—leucaspis.

Flowers somewhat smaller, with shorter and broader segments; sepals pale rose-purple mottled with white; petals and lip deeper in colour than the sepals; callus whitish with yellow-brown dots.

P. rosea leucaspis, Rolfe in Gard. Chron. XXVI. (1886), p. 276. P. equestris leucaspis, Rchb. in Gard. Chron. XV. (1881), p. 688.

This is the commonest of the Philippine Islands' Phalænopses; it is abundant in the hot valleys and along the streams in the neighbourhood of Manila, and is spread generally over the island of Luzon, often associated with *Phalænopsis Aphrodite* and *P. Schilleriana.* It was introduced in 1848 by our Exeter firm, through Thomas Lobb. The variety is said to have first appeared in the collection of M. Pescatore, at St. Cloud, near Paris, soon after the introduction of the species.

P. Sanderiana.

Leaves oblong or ovate-oblong, 6—10 inches long, 2½—4 inches broad, usually dark green, but occasionally more or less spotted and marked with grey, which sometimes disappears with age. Peduncles 20—30 inches long, pale greenish purple spotted with white, terminating in a loose 7—12 or more flowered raceme.* Flowers 3 inches in diameter; sepals oval-oblong, the upper one light rose-pink, the lateral two paler and mottled with white; petals shortly clawed, the blade very broad, sub-rhomboidal and coloured like the upper sepal; lip three-lobed, the lateral lobes broad, sub-orbicular, incurved over the column, the apices nearly meeting, white, faintly spotted with pale rose externally, with a yellow blotch at the base on the inner side; the front lobe hastate, curved upwards at the apex, which is prolonged into two flexuose, incurved tendrils an inch long, the blade white with some longitudinal purple streaks at the base; crest bilobate, each lobe bidentate at the tip, bright yellow spotted with red. Column terete, white with a rose-purple stain at the apex.

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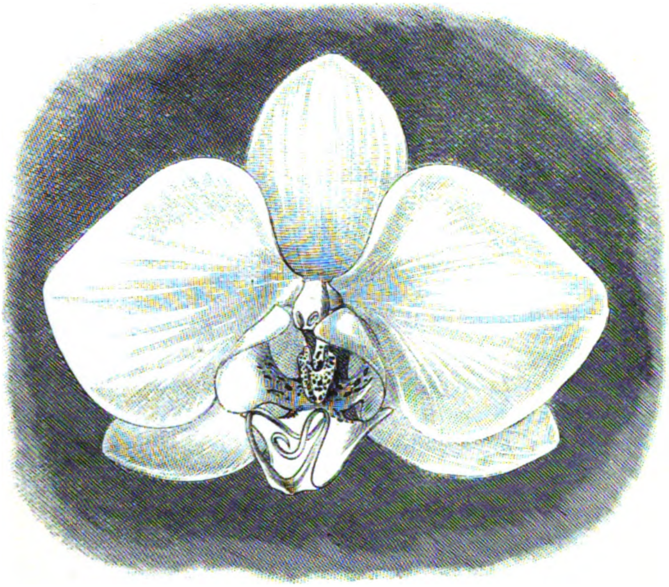
* Probably branched in the stronger plants.

Phalænopsis Sanderiana, Rchb. in Gard. Chron. XIX. (1883), p. 646. *The Garden XXIV.* (1888), pl. 407. Godefroy's *Orchidophile* (1885), p. 18. Williams' *Orch. Alb. V.* t. 209.



Phalænopsis Sanderiana alba.

sub-vars.—*alba*, flowers white with a few light purple spots at the base of the side lobes of the lip and some yellow spots on the crest; *marmorata* (Gard. Chron. XX. (1883), p. 812), the lateral sepals with rows of small purple spots at the base, the side lobes of the lip with three nearly parallel purple lines, the front lobe marbled with purple; *punctata* (Gard. Chron. VII. s. 3 (1890), p. 78), the lateral sepals spotted like those of *Phalænopsis Stuartiana.*

Introduced by Messrs. Sander and Co. from the Philippine Islands in 1882, through their collector, Roebelin; it was shortly afterwards gathered by our collector, David Burke, in the neighbourhood of Davao, on the south-east coast of Mindanao, where it is associated with *Vanda Sanderiana* and *Aërides Lawrenceæ*; it has also been detected on the small island of Serangano, growing on the trunks and branches of trees close to the sea-shore.

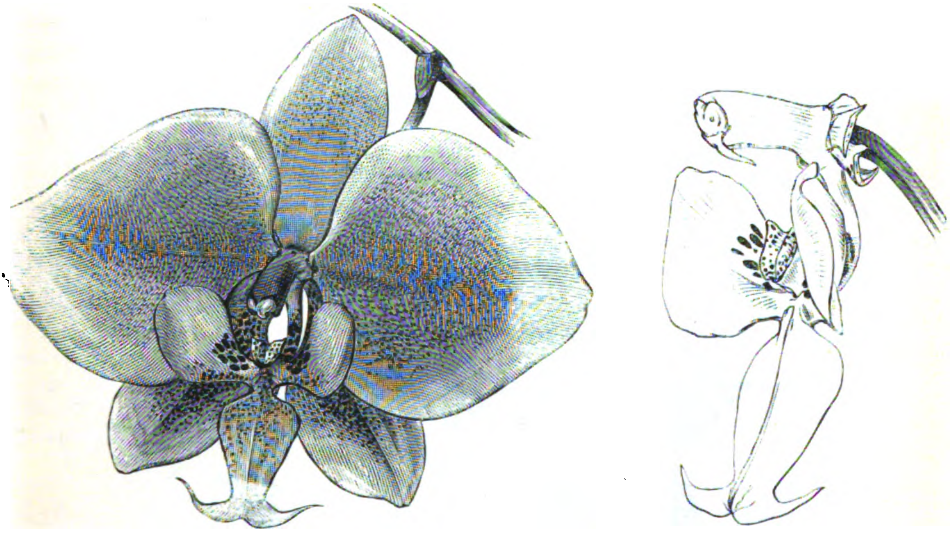
Ever since its first flowering in this country *Phalænopsis Sanderiana* has been generally regarded as a natural hybrid between *P. Aphrodite* and *P. Schilleriana*, and the structure of the flower certainly affords strong evidence of such an origin; it has the general aspect of *P. Aphrodite* with the colour of *P. Schilleriana*, but lighter and more diffused over the whole surface; the trowel-shaped front lobe of the labellum with its apical tendril-like appendages and the side lobes are those of *P. Aphrodite*, while the crest is more like that of *P. Schilleriana*. If we accept the theory of its hybrid origin, the proper place of *P. Sanderiana* would be in the group of natural hybrids of which *P. leucorhoda* is the type, and which bears unmistakeable marks of being derived from the same pair of species. Nevertheless there are other circumstances attending the environment of *P. Sanderiana* that must not be overlooked, of which the most prominent are these:—It has been brought from a locality remote from the habitat of the supposed parents, of whose presence in that locality no evidence is forthcoming; it has been imported unmixed in considerable numbers, and not as in the case of undoubted hybrids as isolated plants, whose appearance among the importations of the assumed parents is comparatively a rare occurrence. On these grounds, therefore, we recognise *P. Sanderiana* as a species in the ordinary acceptation of the term; but whether species or hybrid it is, without question, one of the most beautiful of the section to which it belongs—EUPHALÆNOPSIS.

P. Schilleriana.

Leaves elliptic-oblong, variable in size, and rarely exceeding 3—5 in number, the largest 12—15 or more inches long, and 4—4½ inches broad, deep dull green, marbled and blotched with grey, the grey blotching frequently taking the form of irregular transverse parallel bars. Peduncles sometimes attaining a length of 3 or 4 feet, loosely branched, greenish crimson mottled with white, with a small deciduous bract at each node. Flowers 3—3½ inches in diameter, but less when the flowers are very numerous; sepals and petals delicate rose-purple suffused with white, the lateral sepals dotted with purple on the inner basal half, the sepals elliptic-oblong, the petals sub-rhomboidal, twice as broad as the sepals; lip clawed, three-lobed, the claw long, white spotted with red-purple; the side lobes rounded, oblong, falcate, incurved, white with a yellow stain spotted with red at the base; the front lobe broadly unguiculate then cordate, gradually contracted towards the apex, and terminating in two incurved appendages like the flukes of an anchor, white or pale rose-purple, usually dotted with amethyst-purple; crest a short column terminating in two spreading lobes, bright yellow spotted with red. Column semiterete; anther beaked.

Phalænopsis Schilleriana, Rchb. in Hamb. Gartenz. 1860, p. 144. Id. in Gard. Chron. 1860, p. 216. Id. *Xen. Orch. II.* p. 1. t. 101. Warner's *Sel. Orch. I.* t. 1 (1862). *Id. III.* t. 5 (splendens). Van Houtte's *Fl. des Serres, XV.* t. 1559—60. *Illus. hort. X.* t. 348. *Bot. Mag.* t. 5530. Regel's *Gartenfl.* 1868, t. 581. Jennings' *Orch.* t. 15. De Puydt. *Les Orch.* t. 35. *Fl. Mag.* N.S. 1877, t. 257.

sub-vars.—*immaculata* (Gard. Chron. III. (1875), p. 429), the spots of the lip and its crest absent; *vestalis* (Gard. Chron. XVII. (1882), p. 330), flowers wholly white.

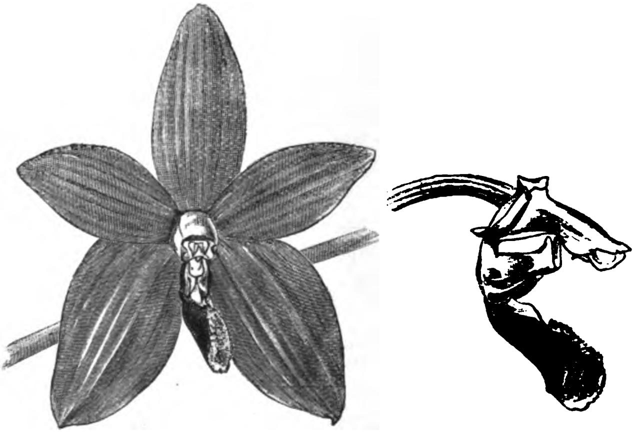


Phalænopsis Schilleriana.

This superb Phalænopsis was introduced from Manila in 1858 by the late Consul Schiller, of Hamburgh, in whose collection at Ovelgönne, on the Elbe, it flowered for the first time in Europe, in the spring of 1860, and to whom it is appropriately dedicated. In the following year it was imported by M. Porte, a French merchant, trading in the Philippines, whose plants were acquired by the late Mr. B. S. Williams, of Holloway, one of which flowered for the first time in this country in Mr. Robert Warner's collection at Broomfield, Chelmsford, in February, 1862. From that time to the present *Phalænopsis Schilleriana* has held a foremost place in the estimation of orchid amateurs.*

Phalænopsis Schilleriana grows under the same conditions as *P. Aphrodite*; with which it is sometimes found associated; both species grow on the trunks and branches of trees, to which they affix themselves by means of their clasping, flattened roots, often so high up as to render the ascent both difficult and dangerous. A small village named Lueban, near Manila, has been for many years past one of its best known stations, but owing to the frequent inroads made upon it, it is now becoming very scarce there.

Besides the sub-varieties described above, which are simply colour variations, variability has also been observed in the labellum of *Phalænopsis Schilleriana*, especially in the form, size, and colour of the anchor-like apical appendages of the front lobe. The late Mr. John Day, who seems to have been the first to notice this variability, has illustrated it in one of his valuable "Scrap-books" by drawings of fifteen different forms.



Phalænopsis speciosa.

P. speciosa.

Leaves obovate-oblong, 7—12 inches long, and 2½—3 inches broad, of a uniform bright green. Peduncles drooping, longer than the leaves, sometimes branched, 9—12 or more flowered. Flowers 2 inches in diameter: sepals and petals spreading in a stellate manner, amethyst-purple with a pale margin, the lateral sepals with a yellowish mucro;

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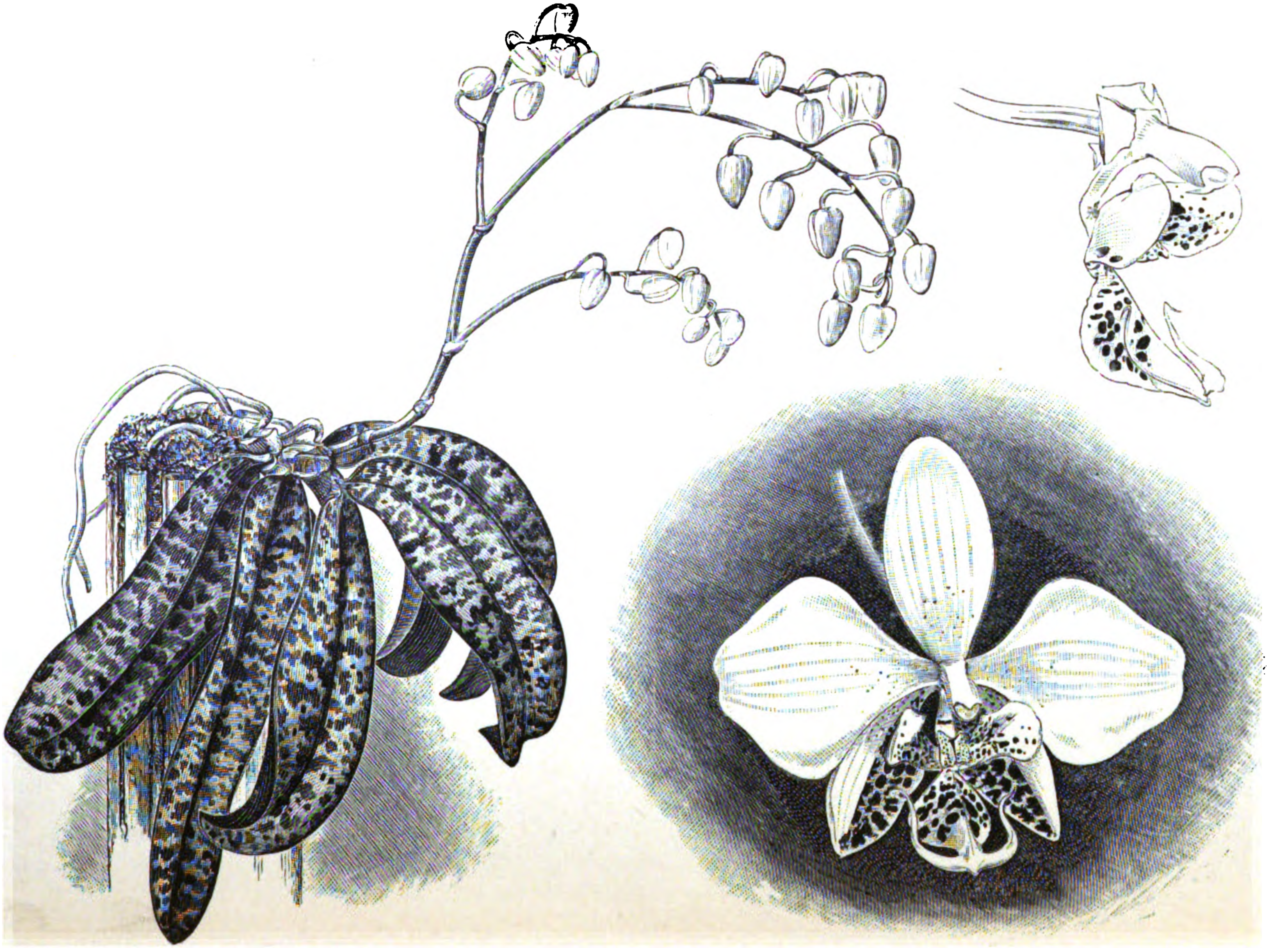
* A very fine lot of *Phalænopsis Schilleriana* is cultivated at Henham Hall, Wangford, the seat of Earl Stradbroke.



Phalænopsis Stuartiana.

the sepals oval-oblong; the petals narrower, elliptic-oblong, acute; lip shorter than the other segments, three-lobed, the side lobes erect, oblong, truncate, with an orange yellow protuberance on the inner side, purple at the base, orange in the middle, white at the apex; the front lobe fleshy, oblong, with an acute, pubescent keel above, amethyst-purple. Column white, swollen at the toothed apex.

Phalænopsis speciosa, Rchb. in Gard. Chron. XV. (1881), p. 562. Williams' *Orch. Alb. IV.* t. 158. Hook. f. Fl. Brit. Ind. VI. p. 30.

sub-vars.—*Christiana* (Gard. Chron. XVIII. (1882) p. 745), sepals and column rose-purple, petals white; *Imperatrix* (Sander's *Reichenbachia II.* t. 51), flowers deep rose-purple with some white markings on the sepals and petals.

Discovered by Major-General E. S. Berkeley growing upon trees, as he himself informs us, in several of the smaller islands of the Malay Archipelago, and introduced by him in 1881; it is one of the handsomest of the species included in the section STAUROGLOTTIS.

P. Stuartiana.

Leaves elliptic-oblong, 7—12 or more inches long, and 3—4 inches broad, freckled above with transverse grey blotches, which often disappear with age, purplish red beneath like those of *Phalænopsis Schilleriana.* Peduncles drooping, of variable length, branched, many-flowered. Flowers 1½—2½ inches in diameter; sepals elliptic-oblong, the dorsal one white, sometimes with a few purple dots on the basal half; the lateral two with a sunk median line, the outer half white, the inner half pale yellow densely spotted with red-purple; petals much larger than the sepals, sub-rhomboidal, white, sometimes with a few purple dots scattered over the basal half; lip three-lobed, with a short, thick, golden yellow crest, split at the summit into two oblong lobes; the lateral lobes of the lip obliquely obovate-oblong, the basilar part yellow spotted with red-purple, the distal part whitish with fewer spots; the intermediate lobe narrow at the base, suddenly enlarged into a sub-rhomboidal blade with two anchor-like appendages at the apex, light yellow, sometimes white spotted with red-purple.

Phalænopsis Stuartiana, Rchb. in Gard. Chron XVI. (1881), p. 748. Id. p. 753, icon. xyl. *Fl. and Pomol.* 1882, p. 49. Williams' *Orch. Alb. V.* t. 237. *Bot. Mag.* t. 6622.

sub-vars.—*bella* (Gard. Chron. III. s. 3 (1888), p. 200), the side lobes of the lip with linear red marks, the front lobe with large purple-chocolate blotches; *Baron Hruby's* (Id. XXI. (1884), p. 372), sepals and petals purple on the back with a white margin; *nobilis* (Williams' *Orch. Alb. I.* t. 39), flowers larger in all their parts with fewer and larger spots on the lateral sepals and lip; *punctatissima* (Gard. Chron. XVII. (1882), p. 44), sepals and petals covered with minute purple dots in addition to the usual spots on the lateral sepals and lip.

Discovered by Boxall near Surigao, in the extreme north-east of the island of Mindanao in 1881, while collecting Orchids in the Philippine Islands for Messrs. Low and Co., and named in compliment to the former head of that firm, the late Mr. Stuart Low. It was shortly afterwards gathered by our collector, David Burke, in the same locality and around Lake Maynit, in north-east Mindanao, where it is abundant. Like all the other species of EUPHALÆNOPSIS, it is always found in close proximity to water, in some places so close to the sea-shore that it can scarcely fail to be washed by the salt spray during the prevalence of storms.

P. sumatrana.

Leaves obovate or obovate-oblong, sub-acute, 6—10 inches long. Peduncles ascending, as long as the leaves, 5—9 flowered. Flowers about 2 inches in diameter; sepals and petals similar and sub-equal, ovate-oblong, acute, cream-white barred with red-brown, the petals a little narrower and more cuneate than the sepals; lip shortly clawed, three-lobed, the side lobes ligulate-oblong, erect, truncate, the apex prolonged backwards into a kind of tooth, white with some orange spots on the inner side; the front lobe fleshy, oblong in outline with a prominent keel above, with two small erect teeth at the base and a dense tuft of short, hispid hairs at the apex, white with some purple streaks on each side of the keel. Column semi-terete, notched at the apex.

Phalænopsis sumatrana, Korth. et Rchb. in Hamb. Gartenz. 1860, p. 115. Rchb. in Gard. Chron. 1865, p. 506, icon. xyl. *Bot. Mag.* t. 5527. Van Houtte's *Fl. des Serres, XVI.* t. 1644 (copied from the Bot. Mag.). P. zebrina, Teijsm. et Binn. Pl. nov. in hort. Bogor. cult. p. 15 (1863). *Flore des Jardins des Pays Bas, IV.* p. 146.

sub-vars.—*Mr. Kimball's* (Gard. Chron. IV. s. 3 (1888), p. 6), sepals and petals broader, bright yellow with red transverse bands, lip light yellow; *paucivittata* (Id. XVII. (1882), p. 628), the red-brown bars on the sepals and petals fewer and paler, the purple streaks on the lip darker; *sanguinea* (Id. XV. (1881), p. 782), the lateral sepals dark red-brown with a few yellow-green markings.

The original discoverer of *Phalænopsis sumatrana* was the Dutch naturalist, Dr. Korthals, formerly at the head of the scientific staff commissioned to investigate the natural history of the Dutch possessions in the Malay Archipelago, who met with it in southern Sumatra some time prior to 1839. His sketch of it preserved at Leyden was all that was known of it till it was re-discovered by Teijsman in 1859 along with *P. violacea,* in the Sumatrian province of Palembang, and was sent by him to the Botanic garden attached to the University of Leyden, under the name of *P. zebrina,* where, under the able management of M. Witte, the Superintendent, it flowered for the first time in Europe in 1861, one plant only surviving the journey. It was first introduced into this country by Messrs. Low and Co. in 1864, and flowered for the first time in the collection of the late Mr. John Day, at Tottenham, in the summer of the following year. In 1881 it was detected by Curtis, at that time collecting for us in the Malay Archipelago, in the hot, damp forests of Palembang, growing on trees overhanging streams and water-courses, generally on the trunks and much shaded, sometimes associated with *P. violacea.*

The two last-named sub-varieties noticed above appeared among Curtis' collection. Two others were noticed and named by Teijsman, but which are now probably lost to cultivation. *P. sumatrana* usually flowers in May and June.

P. tetraspis.

Leaves obovate, cuneate, 8—9 inches long and 2—3 inches broad. Peduncles much shorter than the leaves, 3—5 flowered. Flowers 1½—2 inches in diameter, ivory-white, the pedicels sheathed at the base by a small triangular deciduous bract; sepals and petals similar, spreading, oval-oblong, acute, the two lateral sepals broader than the dorsal one; lip fleshy, three-lobed, the side lobes ligulate, curved upwards and inwards, truncate at the free end, yellowish on the outer side; the front lobe sub-rhomboidal, with a tuft of bristles at the apex; crest sub-conic. Column swollen at the base.

Phalænopsis tetraspis, Rchb. Xen. Orch. II. p. 146 (1868). Id. in Gard. Chron. XV. (1881), p. 562. Hook. f. Fl. Brit. Ind. VI. p. 30.

Originally discovered by Thomas Lobb, while collecting for us in Malaysia, who gave no locality, and whose dried flowers were communicated by us to the late Professor Reichenbach. The first living plants received in this country were sent to Mr. William Bull, of Chelsea, in 1881, by Major-General E. S. Berkeley, who had detected them in the Andaman Islands, "growing on Mangrove and other trees in muddy swamps, at the extreme end of the creeks, where the water is fresh, and where the plants hang from the branches a few feet above the water, growing with extraordinary luxuriance."*

P. violacea.

Leaves variable in size, broadly oval or elliptic-oblong, the largest 6—9 inches long, 3—4 inches broad, bright shining green. Peduncles stoutish, short, sheathed at each joint by a triangular, acute, pale green, keeled bract, 2—5 or more flowered. Flowers 2—3 inches in diameter, the dorsal sepal and petals similar, ovate-oblong, mucronate, greenish white with a bright violet-purple blotch at the base, which sometimes spreads to beyond the middle; the lateral sepals oblong, acute, sub-falcate, with a depressed mid-line and keeled behind, the inner half violet-purple to two-thirds of the length, the apical third whitish, the outer half greenish white; lip shortly clawed, three-lobed, the side lobes oblong, erect, truncate, golden yellow, with a small yellow crest between them that is prolonged in front into a narrow plate, bifid at the apex; the front lobe bright violet-purple, obovate-oblong, apiculate, keeled above, and with two small bristles at the basal end of the keel, concave beneath. Column thickened at the base, terete above, deep purple.

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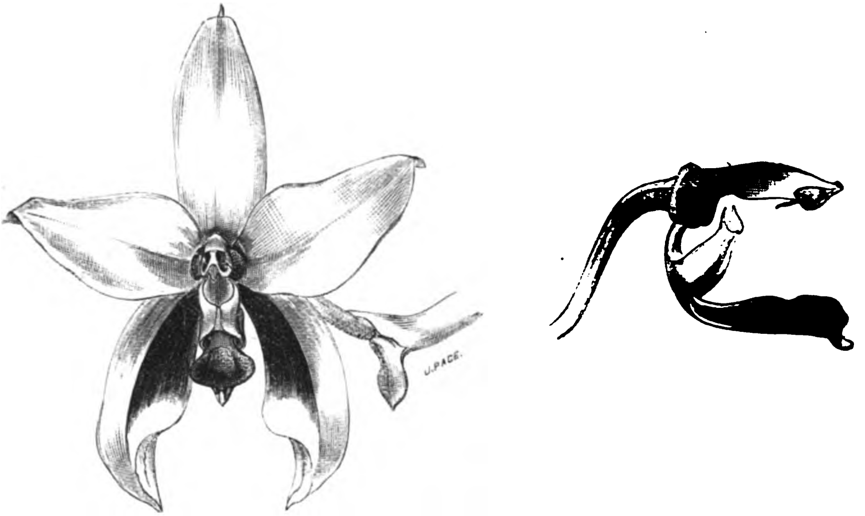
* Gard. Chron. II. s. 3 (1887), p. 74.

Phalænopsis violacea, Teijsm. et Binn. Pl. nov. in hort. Bogor. cult. p. 16 (1863). *Flore des Jardins des Pays Bas, IV.* p. 129. Rchb. in Gard. Chron. X. (1878), p. 234. *Fl. Mag.* N.S. t. 342 (1879). Gard. Chron. XVI. (1881), p. 145, icon. xyl. Williams' *Orch. Alb. IV.* t. 182. Hook. f. Fl. Brit. Ind. VI. p. 29.



Phalænopsis violacea.

sub-vars.—*alba* (Pl. nov. in hort. Bogor. cult. p. 17), sepals and petals French-white, the side lobes and crest of the lip yellow, the front lobe light rose; *Baron Schroeder's* (*Illus. hort.* 1885, t. 173. Gard. Chron. XVIII. (1882), p. 680), the basal half of all the segments bright purple, the colour partially broken up into lines; *Mr. Bowring's* (Gard. Chron. XXII. (1884), p. 262), light yellow with a broad purple stain on the lateral sepals and some purple markings at the base of the petals and dorsal sepal; *Mr. Murton's* (Id. X. (1878), p. 234), light lemon-yellow with a purple blotch at the base of the lateral sepals, the base of the column and middle lobe of the lip stained with the same colour.

Phalænopsis violacea was discovered by Teijsman, near Palembang, in Sumatra, and was sent by him to the Botanic garden at Leyden in 1859, and at the same time to the collection of M. Willinck, at Amsterdam. It was first described in the publication quoted above by M. Witte, the Superintendent of the Leyden garden, where it flowered for the first time in Europe in 1861, and two years later it was again described by its discoverer in the list of new plants cultivated in the Botanic garden at Buitenzorg, in Java; this description is the first usually quoted by botanists, Teijsman being undoubtedly the author of the name. Nothing more appears to have been heard of it till it was sent by Mr. Murton, of the botanic garden at Singapore, to Mr. M. H. Williams, of Tredrea in Cornwall, in whose collection it flowered in 1878, and later in the same year a plant from the same source flowered in our Chelsea nursery. Two years afterwards we received a consignment of plants from southern Sumatra, which had been collected by Curtis, who found them growing under the same conditions as *P. sumatrana,* with which *P. violacea* is sometimes associated.

The colour of the flowers of this species varies considerably, especially as regards the area covered by the purple; besides the sub- or colour varieties noted above, several others not seen by us have received distinguishing names.

HYBRID PHALÆNOPSES.

The existence of natural hybrids among Phalænopses was first broached by Dr. Lindley in 1853, when a plant which had been imported by us from the Philippine Islands along with *Phalænopsis Aphrodite,* was found upon flowering to combine the characters of that species with those of *P. rosea;* he thence surmised that it might be a natural mule between them, and he accordingly named it *P. intermedia.** Subsequently other forms bearing marks of hybridity were introduced from the same rich Phalænopsis region; some of them evidently derived from the same parentage as the first introduced hybrid, others from a different parentage in which *P. Schilleriana* may have participated. There is thence in cultivation a group of supposed natural hybrids, which have originated from *P. Aphrodite, P. Schilleriana,* and *P. rosea.*

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* Paxton's *Flower Garden, III.* p. 163.

Among the experiments undertaken by Seden in hybridising species of Phalænopsis one has proved to be of exceptional interest from a scientific point of view. He fertilised *Phalænopsis rosea* with the pollen of *P. Aphrodite,* and the resulting progeny was the *P. intermedia,* of Lindley. This was the second instance in which the existence of natural hybrids among orchids has been proved by direct experiment.* Subsequent crosses between other species have resulted in adding several beautiful and distinct forms to the list of cultivated Phalænopses.

Hybrid Phalænopses thence fall under two headings, the first comprising those introduced from the habitats of the species from which they have been derived; the second, those raised artificially in the glass houses of Europe. In accordance with the course adopted in this work, the hybrids derived from the same pair of species are brought under the same name, and deviations from the first described form are described as varieties of that form.

NATURAL HYBRIDS.

Phalænopsis intermedia.

Leaves as in *Phalænopsis Aphrodite,* but rarely attaining the dimensions of the larger ones under cultivation. Peduncles usually paniculate, but sometimes simple and racemose. Flowers about 2 inches in diameter; sepals elliptic-oblong, white; petals also white, sub-rhomboidal, much broader than the sepals; lip with an incurved white claw spotted with red, three-lobed; the side lobes erect, orbicular-spathulate, light amethyst-purple, the front lobe broadly cordate, with two reflexed cirri at the apex, reddish purple; crest two-lobed, yellow spotted with red. Column terete, amethyst-purple.

Phalænopsis intermedia, Lindl. in Paxt. Fl. Gard. III. p. 163, fig. 310 (1853).
P. Lobbii, Hort.

var.—Brymeriana.

Sepals and petals white with light amethyst-purple veins, the lateral sepals spotted with purple at the base, the petals with a purple stain near the base; the side lobes of the lip light purple streaked with red, the front lobe red-purple.

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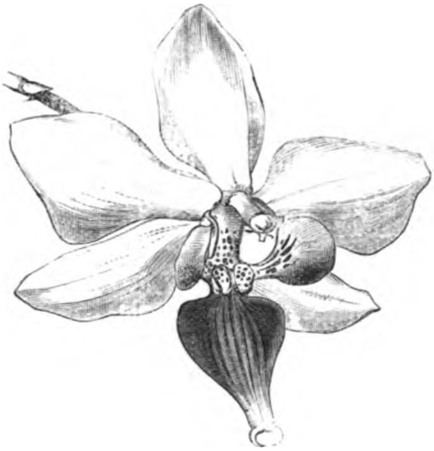
* See Masdevallia, p. 72.

P. intermedia Brymeriana, Rchb. in Gard. Chron. V. (1876), p. 366. *Fl. Mag.* N.S. t. 263.

var.—Portei.

Flowers somewhat larger than the typical form; sepals and petals white with a purple stain at the base of each, the basal area of the side lobes of the lip light tawny yellow spotted with red, the apical area amethyst-purple, the front lobe amethyst-purple toned with red.

P. intermedia Portei, Rchb. in Bot. Zeit. 1863, p. 168. Warner's *Sel. Orch. II.* t. 2. *Fl. Mag.* N.S. t. 162. P. Portei, Gard. Chron. V. (1876), p. 370, with figs.



Phalænopsis intermedia.

Phalænopsis intermedia first appeared as a solitary plant among an importation of *P. Aphrodite* received by our Exeter firm from Thomas Lobb in 1852, and this remained the only one known of this hybrid till two more were brought from the Philippine Islands, in 1861, by a French trader named M. Porte, and which differed from the original *P. intermedia,* and received the varietal name under which it is described above. Thirteen years elapsed before another addition was made to the group, and then it was amongst an importation of Messrs. Low and Co.; one of these plants flowered in Mr. Brymer's collection, at Ilsington House, Dorchester, in the spring of 1876, which differing from the preceding introductions was named in compliment to that gentleman. Since that date the typical form and also the two varieties have appeared very sparingly amongst importations by different horticultural firms, the flowers showing some trifling deviation in colour from the first described forms, such as usually happens among hybrids, whether naturally or artificially raised. The finest specimen of *P. intermedia* we have yet seen is in the collection of the Right Honourable Lord Rothschild, at Tring Park.

As already stated *Phalænopsis intermedia* has been raised artificially by Seden, from *P. Aphrodite* and *P. rosea*; the plant raised from them flowered for the first time in our Chelsea nursery in the spring of 1886.

P. leucorhoda.

A supposed natural hybrid between *Phalænopsis Aphrodite* and *P. Schilleriana.* Leaves sometimes wholly green as in the first-named species, sometimes freckled with grey, but not so much as in *P. Schilleriana*, the grey frequently disappearing with age. Flowers as large as those of *P. Aphrodite;* sepals and petals white, more or less stained with rose-purple on the basal half; lip nearly as in *P. Schilleriana*, with the apical tendrils of *P. Aphrodite*, but somewhat shorter; the side lobes white spotted with red and with a yellow stain at the front margin; the front lobe white with a yellow stain at the base.

Phalænopsis leucorhoda, Rchb. in Gard. Chron. III. (1875), p. 301. *Fl. Mag.* N.S. t. 166.

var.—casta.

Sepals white, the dorsal one with a light purple stain at the base, the lateral two with a light yellow stain spotted with red at the base; petals wholly white; all the lobes of the lip white with a yellow stain spotted with red at the base like the lateral sepals, but brighter; the front lobe, as in *Phalænopsis Aphrodite*, with the basal angles less acute and with the apical tendrils broader and shorter.

P. leucorhoda casta, supra. P. casta, Rchb. in Gard. Chron. III. (1875), p. 590. Williams' *Orch. Alb. V.* t. 229. Sander's *Reichenbachia II.* t. 87.

var.—Cynthia.

Leaves as in *Phalænopsis Schilleriana ;* sepals and petals white flushed with light rose-purple towards the base, the lateral sepals dotted with red on the inner basal half; the side lobes of the lip nearly as in *P. Aphrodite*, white spotted with purple on the basal half; the front lobe nearly as in *P. Schilleriana*, with short, anchor-shaped apical appendages, white with a yellow stain at the base, spotted and marked with purple.

P. leucorhoda Cynthia, supra. P. Cynthia, Rolfe in Gard. Chron. VII. s. 3. (1890), p. 132. Id. p. 227.

Phalænopsis leucorhoda was introduced from the Philippine Islands by Messrs. Low and Co., in 1874, amongst an importation of the supposed parents; *costa* was introduced in like manner about the same time by the same firm. Several intermediate forms have since appeared in various collections that have well nigh bridged over the not very broad difference that originally separated them. *Cynthia* first appeared in the collection of Mr. F. Wigan, at Clare Lawn, East Sheen, where it flowered in the spring of 1890; it was probably introduced by Messrs. Low and Co., as a Phalænopsis in their establishment produced flowers shortly afterwards that were almost identical with those of Mr. Wigan's plant.* The influence of *P. Schilleriana* greatly preponderates in this supposed hybrid, and it may possibly have resulted from the reversed cross of that which produced *P. leucorhoda* and its variety *casta.*

The forms we have here described constitute one of the most beautiful groups of Phalænopses in cultivation.

P. Veitchiana.

A supposed natural hybrid between *Phalænopsis Schilleriana* and *P. rosea.* Leaves nearly as in *P. rosea* with a few faint greyish markings irregularly scattered over the surface. Flowers 2 inches in diameter; sepals white with a flush of light purple below the middle; petals sub-rhomboidal, broader than the sepals, white with a deeper purple stain; the side lobes of the lip broadly spathulate, incurved, the basal half white spotted with red, the apical half crimson-purple; the front lobe somewhat lyre-shaped, with two straight, pointed teeth at the apex, crimson-purple. Column purplish.

Phalænopsis Veitchiana, Rchb. in Gard. Chron. 1872, p. 935. Id. XXI. (1884), p. 270 (brachyodon). *Fl. Mag.* N.S. t. 213.

This is one of the rarest as well as one of the most distinct of the natural hybrids. It first appeared as a solitary specimen among one of our own importations prior to 1872, in which year it flowered for the first time. It remained the only plant known of *Phalænopsis Veitchiana* till a second was imported by Messrs. Low and Co. in 1883, which differed but little from the first, except in the shorter, thicker, apical teeth of the front lobe of the labellum.

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* Gard. Chron. VII., s. 3 (1890), p. 227.

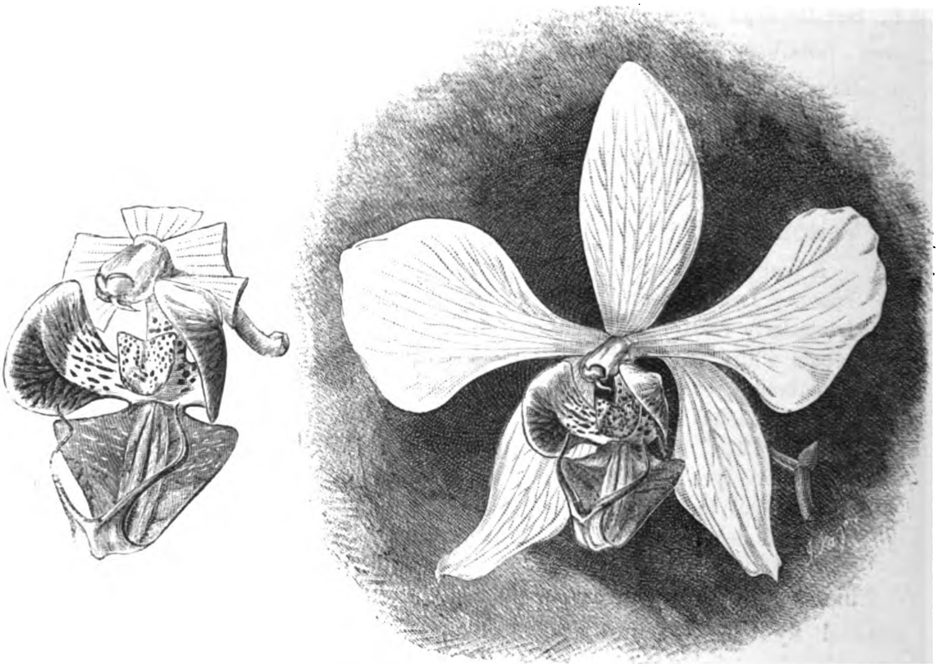
GARDEN HYBRIDS.

Phalænopsis "F. L. Ames."

P. amabilis × *P. intermedia.*

Leaves oval-oblong, bright green. Flowers 3 inches in diameter, with the general shape of those of *P. amabilis*; sepals and petals white; lip suffused and marked with a peculiar shade of reddish purple; the side lobes white externally, spotted with light purple at the base on the inner side, above which the colour runs into lines; the front lobe is striated with reddish purple in front, and suffused with the same colour behind; crest yellow spotted with red.

Phalænopsis "F. L. Ames," Rolfe in Gard. Chron. III. s. 3 (1888), p. 200, icon. xyl.



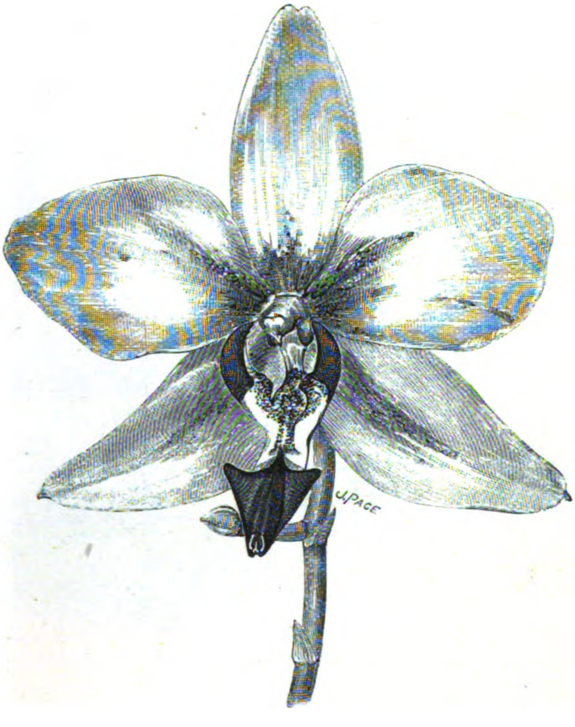
Phalænopsis "F. L. Ames."

Raised by Seden at our nursery. A most interesting and distinct hybrid, of which three species are concerned in the ancestry, the pollen used being that of *P. intermedia*, itself a natural hybrid between *P. Aphrodite* and *P. rosea*. The colour of the labellum is very peculiar, and strongly marks the individuality of this beautiful Phalænopsis, which is dedicated to the Hon. F. L. Ames, of North Easton, Massachusetts, a liberal patron of horticulture, and the possessor of one of the finest orchid collections in cultivation.

P. Harriettæ.

P. amabilis × *P. violacea.*

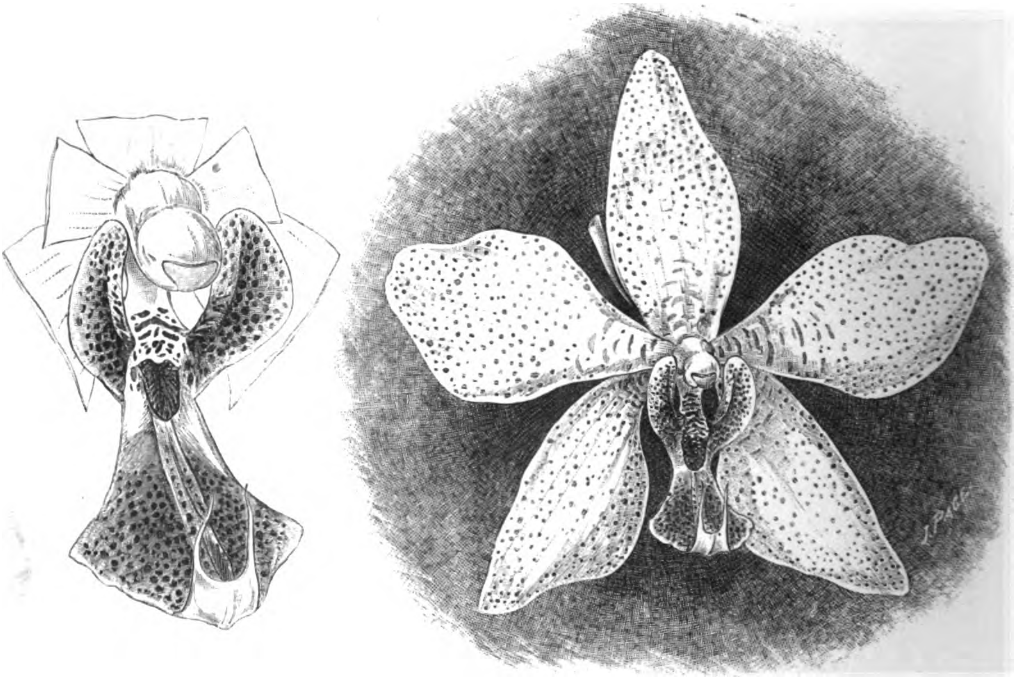
Leaves strictly oval, bright green. Peduncles two or more flowered. Flowers about 3 inches in diameter, intermediate between those of the parents; sepals and petals cream colour, much spotted and stained with rose-purple on the basal half, the dorsal sepal oval-oblong, the lateral sepals ovate-oblong, keeled behind, the colour confined to the inner half, as in *Phalænopsis violacea*; petals much broader and obtuse, as in *P. amabilis*; lip distinctly clawed, the lateral lobes intermediate in shape between the broad spreading ones of *P. amabilis* and the narrow appressed fleshy ones of *P. violacea*, cream colour spotted with brown-purple below, rose-purple above; the intermediate lobe broadly trowel-shaped with the lateral angles somewhat acute and the apex distinctly notched, fleshy, and bright rose-purple, as in *P. violacea*. Column stained with rose-purple



Phalænopsis Harriettæ.

Phalænopsis Harriettæ, Rolfe in Gard. Chron. Id. s. 3 (1888), p. 8, icon xyl. *The Garden*, *XXXVIII.* (1890), t. 766.

Raised by Seden at our nursery. A very beautiful and interesting hybrid that has for its parents species belonging to two distinct sections of the genus. The remarkable manner in which the floral characters of these species have been blended may be gathered from the above description and the accompanying woodcut. The only plant raised has been acquired by the Hon. Erastus Corning, of Albany, U.S.A., and is named in compliment to that gentleman's daughter.



Phalænopsis "John Seden."

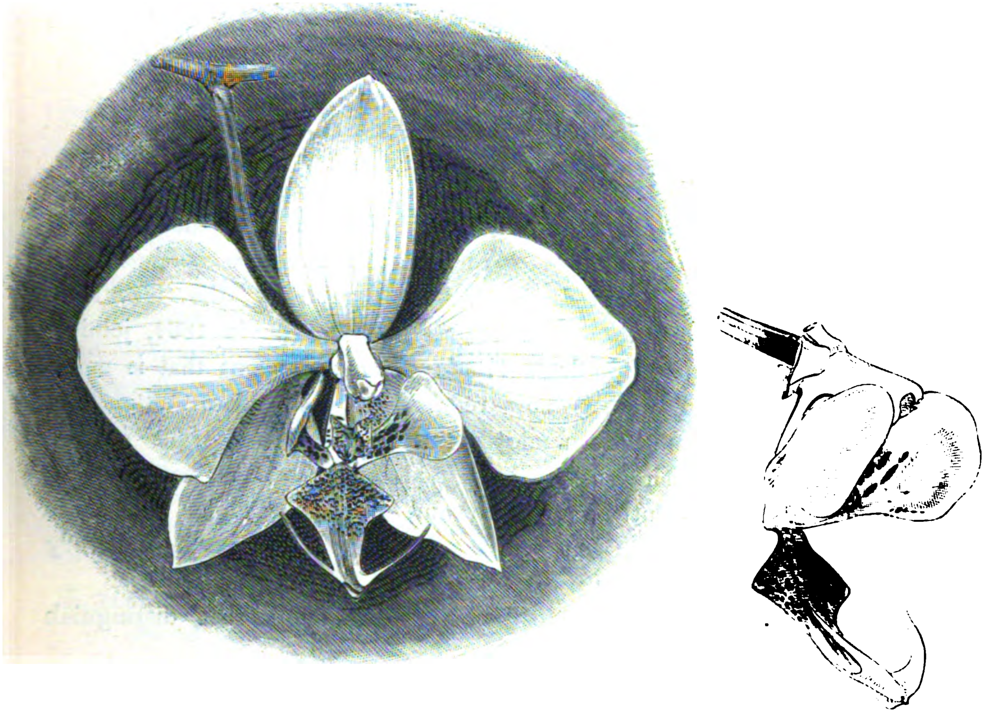
P. "John Seden."

P. amabilis × *P. Lüddemanniana.*

Leaves oval-oblong, dark glossy green. Flowers 3 inches in diameter, the sepals and petals ivory-white densely and uniformly dotted all over with beautiful light purple, the claw of the lip similarly dotted, the lobes suffused with reddish purple; sepals elliptic-oblong, the lateral two oblique; petals similar but broader and more obtuse; lip intermediate in all the lobes, the lateral two fleshy and sub-erect; the front one nearly diamond-shaped with the sharp keel of *Phalænopsis Lüddemanniana*, but destitute of its long hairs, upturned at the apex, and bearing a pair of awl-shaped tendrils; crest yellowish, oblong, deeply channelled, narrowed in front, and terminating in two acute points.

Phalænopsis "John Seden," Rolfe in Gard. Chron. III. s. 3 (1888), p. 331, icon. xyl.

Raised by Seden at our nursery. "Of all the many surprises which have emanated from that wonderful laboratory at the Royal Exotic Nursery this is altogether unsurpassed, something quite unique; its great beauty is acknowledged by all who have seen it."* This fine hybrid is now in the collection of Baron Schroeder, at The Dell.



Phalænopsis Rothschildiana.

P. Rothschildiana.

P. Schilleriana × *P. amabilis.*

Leaves freckled with grey, as in *Phalænopsis Schilleriana.* Flowers about 3 inches in diameter, with the general shape of those of *P. amabilis*; the dorsal sepal and petals white, the outer half of the lateral sepals also white, the inner half light yellow spotted with purple towards the base; the side lobes of the lip nearly as in *P. amabilis*, pale yellow on the inside, spotted with purple at the base; the front lobe stained with yellow and spotted with red from the base to beyond the middle, the apical area white, the tendrils anchor-shaped at the base with the arms elongated into slender cirri; crest bright canary-yellow dotted with red-purple.

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* Gard. Chron. loc. cit. supra.

Phalænopsis Rothschildiana, Rchb. in Gard. Chron. I. s. 3 (1887), p. 606.

Raised by Seden at our nursery. It is dedicated to the Right Hon. Lord Rothschild, a distinguished amateur of Phalænopses, and whose cultivation of these plants at Tring Park is probably the best in Europe.

RHYNCHOSTYLIS.

Blume, Bijdr. p. 285, t. 49 (1825). Rchb. in Walp. Ann. VI. p. 887 (1864). Benth. et Hook. Gen. Plant. III. p. 574 (1883).

The genus Rhynchostylis was founded by Blume upon the beautiful species commonly known in gardens as *Saccolabium Blumei*, and which Reichenbach adopted in his monograph of the Orchideæ published in Walper's *Annales Botanices Systematicæ*, in 1864, joining with the type species Lindley's *Vanda violacea*, a plant that is much nearer Saccolabium, and is now referred to that genus. Bentham has followed Reichenbach in adopting Blume's Rhynchostylis for the type species, to which must now be added the scarcely less beautiful Siamese species recently introduced and cultivated under the name of *Saccolabium cœleste*, but which conforms to the type in every essential generic character.

The following are the most obvious characters that distinguish Rhynchostylis from Saccolabium:—

> In Rhynchostylis the column is produced at its base into a kind of foot, to the apex of which the labellum is attached, and not simply continuous with the ovary with the labellum sessile at its base as in Saccolabium. Moreover, in Rhynchostylis the saccate spur of the labellum is much compressed and opposed to the front lobe, while in Saccolabium the spur or saccate base usually (not always) projects straight downwards at a right angle to the front lobe.

The name Rhynchostylis is derived from ῥυγ'χος (rhynchos), "a beak," and στῦλος (stylos), ' a pillar," in reference to the beaked column of the flower, but as this character pervades most of the allied genera the name is not especially applicable to the species of Rhynchostylis.

Cultural Note.—The cultural treatment of the species and varieties here referred to Rhynchostylis is the same as that of Saccolabium.

Rhynchostylis cœlestis.

Stem stoutish, apparently attaining but a moderate height, emitting from below numerous cord-like roots. Leaves ligulate, fleshy, 4—6 inches long, channelled above, acutely keeled beneath, closely imbricating at the base, unequally lobed and toothed at the apex. Peduncles erect, densely racemose along the distal half. Flowers crowded, ¾-inch in diameter, on white or pale blue, furrowed and slightly twisted pedicels; sepals and petals similar and sub-equal, oval-oblong, obtuse, the lateral sepals the broadest, white with an indigo-blue apical blotch; lip obovate-oblong, the saccate spur much compressed and slightly curved, the basal half of the blade white, the apical half bright indigo-blue. Column very short; anther beaked, dark blue.

Rhynchostylis cœlestis, Rchb. in Gard. Chron. XXIII. (1885), p. 692. Saccolabium cœleste, Rchb. in Gard. Chron. loc. cit. Williams' *Orch. Alb. VIII.* t. 361.

The bright blue of this pretty orchid, a colour so rare among the epiphytal ORCHIDEÆ, renders it exceptionally interesting to amateurs. The information respecting its origin is of a very meagre description, and all that appears to have been divulged is contained in the following paragraph extracted from Williams' *Orchid Album*, sub. t. 361:—"This species was collected and sent home by M. Roebelin, who states that he found it growing upon isolated trees in the rice fields of Siam, these trees being charred stumps which had survived the fires used in clearing the ground for cultivation."

R. retusa.

Stems as thick as the little finger, rarely exceeding a few inches in height under cultivation. Leaves ligulate, spreading or arching, 9—12 inches long, imbricate at base, obliquely two-lobed or truncate at the apex, paler beneath with several yellowish longitudinal lines. Racemes pendulous, longer than the leaves. Flowers crowded, ¾-inch in diameter, on short grooved twisted pedicels, at the base of which is a minute scaly bract; sepals oval-oblong, acute, the lateral two much the broadest; petals narrowly oblong, both sepals and petals white, spotted with amethyst-purple; lip deeply saccate at the base, the sac much compressed, the blade obovate-oblong, channelled above, reflexed at the apex, wholly purple. Column short; anther beaked.

Rhynchostylis retusa, Blume, Bijdr. p. 286 (1825). Rchb. in Walp. Ann. VI. p. 887 (1864). Hook. f. Fl. Brit. Ind. VI. p. 32. Saccolabium Blumei, Lindl. in Bot. Reg. 1841, misc. No. 115. Id. *Sert. Orch* t. 47. Linden's *Pesc.* t. 21 (majus). *Illus. hort.* 1868, t. 545 (majus). De Puydt, *Les Orch.* t. 27. Williams' *Orch. Alb. IV.* t. 169. *Id. V.* t. 288 (Russelianum).

var.—guttata.

Leaves longer, narrower, and more closely set on the stem, sub-pendulous, not arching. Flowers somewhat smaller, more crowded, and often more densely spotted.

R. retusa guttata, Rchb. in Walp. Ann. VI. p. 887 (1864). R. guttata, Rchb. in Bonpl. II. t. 93. Saccolabium guttatum, Lindl. Gen. et Sp. Orch. p. 220. Id. in Journ. Linn. Soc. III. p. 32. *Bot. Mag.* t. 4108. Warner's *Sel. Orch. II.* t. 18 (Holfordianum). S. Rheedii, Wight, Icon. Pl. Ind. or. 1346—7. (1852). Sarcanthus guttatus, Lindl. in *Bot. Reg.* t. 1443 (1831). Aërides guttatum, Regel's *Gartenfl.* 1863, t. 415. Epidendrum retusum, L. Sp. pl. 1351. (1753).

var—præmorsa.

Plant more robust. Leaves shorter and broader, spreading, more distant and distinctly premorse at the apex. Racemes longer Flowers usually paler and with fewer spots.

R. retusa præmorsa, Rchb. in Walp. Ann. VI., p. 887. R. præmorsa Bl. Bijdr., p. 286. Saccolabium præmorsum, Lindl. Gen. et Sp. Orch. p. 221. S. guttatum giganteum, Godefroy's *Orchidophile*, 1888, p. 272.

Rhynchostylis retusa is one of the most widely distributed of Indian orchids; the geographical area over which it is spread is probably as great or even greater than that occupied by any other epiphytal species.* It is found in nearly all parts of Hindostan where the climatic conditions are such as to allow it to live and thrive; also in Ceylon; it is scarcely less abundant in the British provinces in the eastern peninsula, especially in the plains of Lower Burmah,† whence it spreads southwards into Java, where it is common, and where it has established itself in immense numbers in the Teak plantations formed by the Dutch in that colony. Over so extensive a region the plant is found to preserve a remarkable uniformity in the size and colour of its flowers, while in habit its variability is more pronounced, the forms described above being well marked in that respect, and not likely to be confused with each other.

The following graphic account of this orchid as seen in the south of India is communicated by "J. L." to *The Garden, XXXVIII.* (1890), p. 607:—"In Malabar it mostly affects the jungle and marshy banks of sluggish-flowing rivers thick with trees of low stature and thorny undergrowth composed of *Solanum ferox*, spiny Acacias, and the like, where croak innumerable frogs, speaking eloquently of malaria, ague, and fever, and where crawls the deadly cobra, and where other reptiles and insects of strange appearance are abundant. In the midst of such surroundings, pendent from the branches of trees, may be seen the charming blooms of the Saccolabium (Rhynchostylis) spreading a fragrance around which compels

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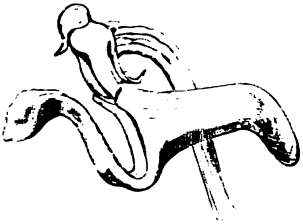
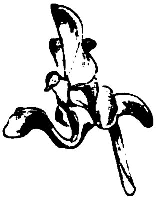
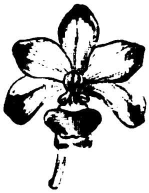
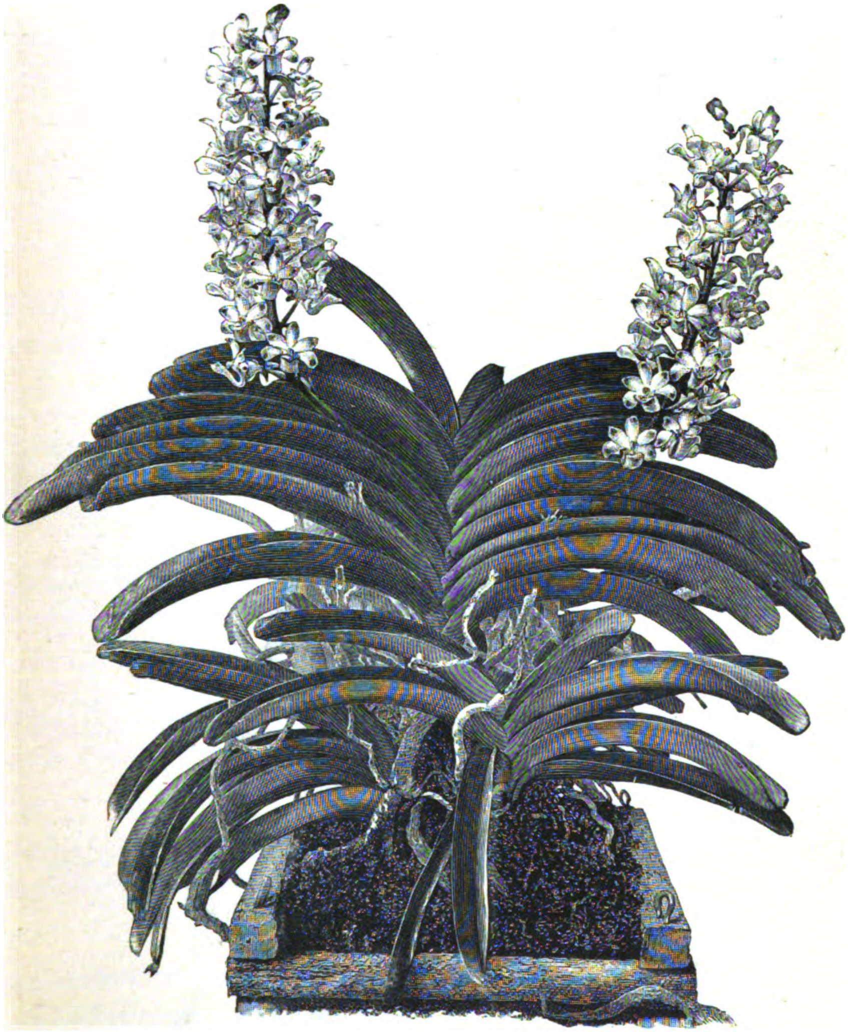
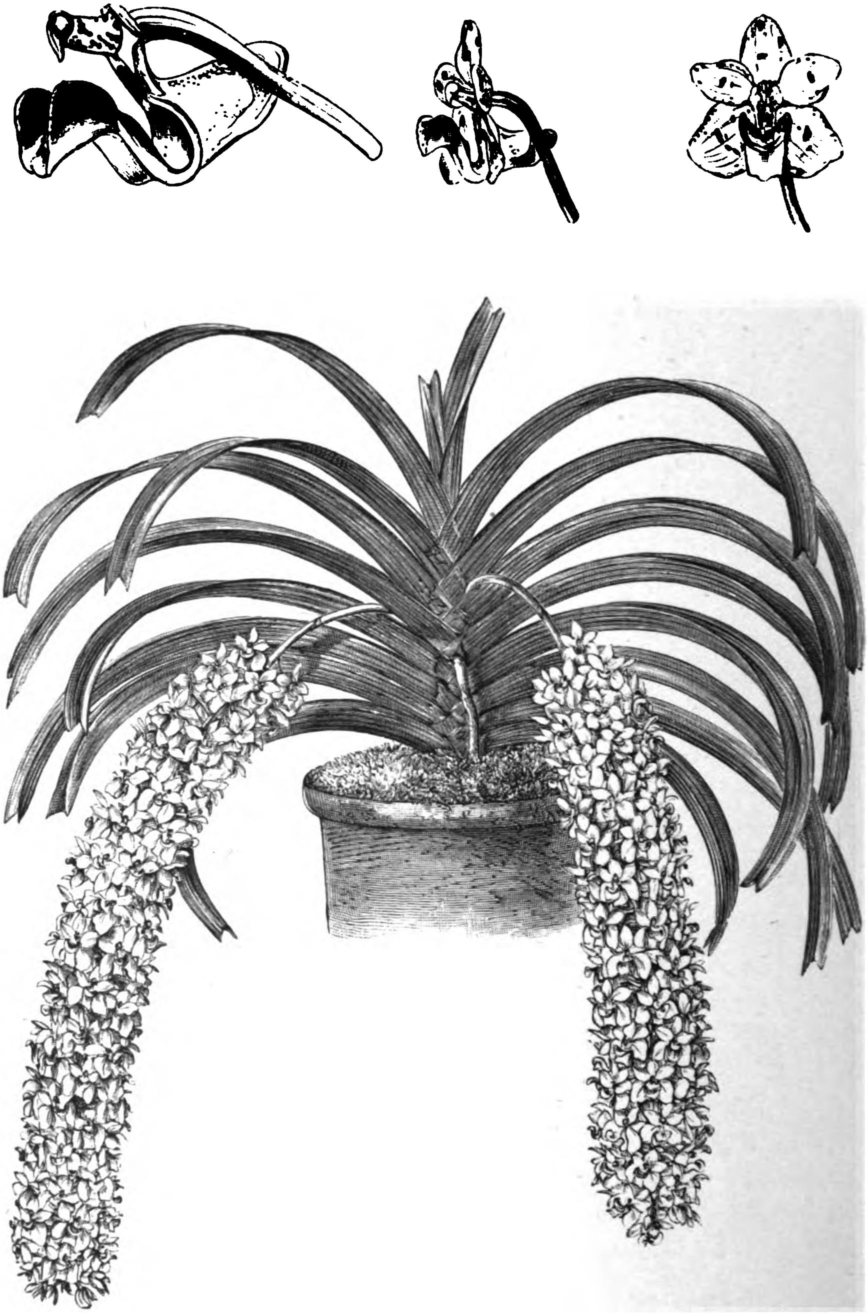
* *Cattleya labiata* and its varieties extend over the South American continent from Rio de Janeiro to Darien; but the interval which separates the Brazilian type from its Colombian varieties is probably immensely in excess of the area over which *C. labiata* is actually spread.

† Col. Benson in Gard. Chron. 1870, p. 796.

Rhynchostylis cœlestis.



Rhynchostylis retusa.

> the explorer to linger in the locality, even at the risk of subsequent attacks of jungle fever. Curiously enough the plants are never found in groups, but singly, with long distances between the individual plants. They come into flower during September and October, or immediately after the south-west monsoon rains cease, and from that date till the first spring showers fall in March or April, these epiphytes enjoy complete rest They are throughout nearly the whole of this period of rest more or less protected from the east winds that prevail for so many months, and they are under the influence of dense fogs during the night and early morning. During the prevalence of the south-west monsoon, which is their growing season, the temperature rarely falls below 21° C. (70° F.), that is, when the sky is cloudy and the rain is pouring in torrents, perhaps for three and four weeks at a time. From the end of October till the end of April, the season of rest, the thermometer frequently falls in the night and early morning to 9° C. (48° F.), so that the range of temperature under which they live in southern India is considerable."

The form now recognised as the type was detected by Dr. Blume during a journey through Java in 1823—4, a short time previous to the publication of his "Contributions" (*Bijdragen*) to the flora of that island, in which it was first described under the now accepted name of *Rhynchostylis retusa*. It was introduced from Java by Messrs. Loddiges in 1838—9, and was figured and described in Dr. Lindley's *Sertum Orchidaceum*, under the name of *Saccolabium Blumei*, on the occasion of its first flowering in this country. It has since been gathered in Lower Burmah, and in other localities in the eastern peninsula. Long, however, before the publication of Blume's *Bijdragen* specimens of the Indian form known in gardens as *Saccolabium guttatum* had been transmitted to Europe, through which the plant became known to Linnæus, who included it in his genus Epidendrum, as he did all the epiphytal orchids known to him. The first notice of it as a horticultural plant occurs in the *Botanical Register* for 1831, where it is figured under the name of *Sarcanthus guttatus*. In the letter-press accompanying the plate Dr. Lindley states that "he saw in 1820, in Sir Joseph Banks' library, a specimen in full flower that had been sent from the Royal Gardens at Kew," and this was probably the first time of its flowering in England. Ten years later a plant was presented to the Horticultural Society of London by the East India Company through Dr. Wallich, which flowered at Chiswick in 1831. From that time to the present the species has been uninterruptedly represented in British orchid collections.

SARCOCHILUS.

R. Br. Prod. p. 332 (1810). Benth. et Hook. Gen. Plant. III. p. 575 (1883).

The genus Sarcochilus possesses but a secondary interest for the cultivators of epiphytal orchids, for although it includes several beautiful species, these are so poorly represented in British collections or are known under other names, that the genus is frequently overlooked by amateurs, and altogether neglected in the popular orchid hand-books. As reconstituted by Mr. Bentham in the *Genera Plantarum*, it includes about thirty species, many of which had been previously distributed among several genera,[*] the founders of these relying chiefly upon the form of the labellum and the habit of the plant, which vary from species to species; but the discovery of other species modifying the value of these characters, suggested the propriety of uniting them all under one genus.

The species now included in Sarcochilus are spread over India, Malaysia, Australia, and the islands in the South Pacific Ocean. The five described in the following pages are among the best known, although not often seen in cultivation. The generic name is derived from σάρξ σαρκὸς, "flesh," and χεῖλος, "a lip," in reference to the fleshy texture of that organ.

Sarcochilus Berkeleyi.

Stem as thick as an ordinary writing pencil, 3—6 inches high in plants observed. Leaves spreading, strap-shaped, 5—6 or more inches long, obtuse or emarginate. Racemes pendulous, longer than the leaves, the rachis pale green, swollen at the base of the pedicels and grooved along the interspaces. Flowers crowded, 1½ inch across vertically, cream-white with a purple stain on the labellum; the dorsal sepal and petals broadly obovate, the former concave, almost galeate; the lateral sepals larger, oblong, obtuse, spreading; lip attached to the foot of the column, clawed, saccate, compressed, three-lobed, the side lobes erect, falcately linear; the front lobe with two erect, horn-like processes above, and prolonged below into a compressed tube dilated at the apex. Column short, greenish; anther beaked.

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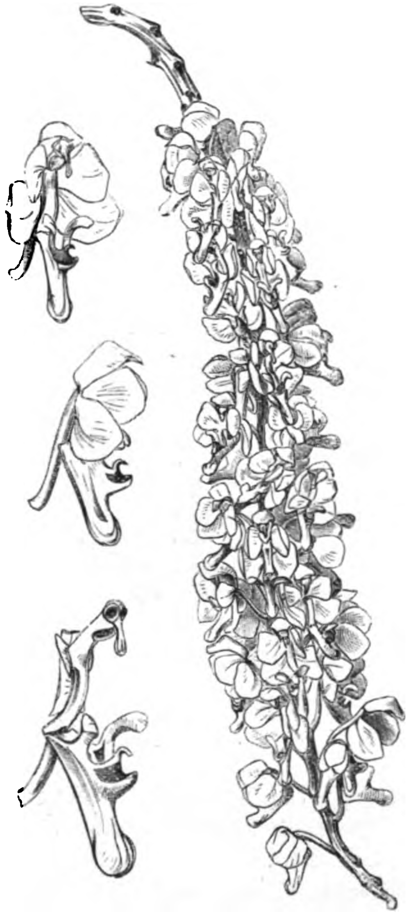
[*] Thus: Dendrocolla, Blume, Bijdr. p. 286. Thrixspermum, Lour. Fl. cochinch. II. p. 519. Ornitharium, Lindl. in Paxt. Fl. Gard. I. p. 188. Micropera, Dalz. in Hook. Kew Journ. III. p. 282. Chiloschista, Lindl. in Bot. Reg. sub. t. 1522. Gunnia, Lindl. in Bot. Reg. sub. t. 1699. Camarotis, Lindl. Gen. et Sp. Orch. p. 219. Reichenbach (Walp. Ann. VI. p. 497) brought under Sarcochilus nearly all the species included in the genus by Bentham, but subsequently removed most of them to Thrixspermum (Xen. Orch. II. p. 120) as being more ancient than Sarcochilus, a course Mr. Bentham did not adopt, "on the very sufficient grounds that the name is utterly bad in construction, and because the description of the type is so incomplete that it would have been impossible to recognise the plant intended by it." (Bot. Mag. sub. t. 7044.)

Sarcochilus Berkeleyi, Hook. f. Fl. Brit. Ind. VI. p. 37 (1890). **Thrixspermum Berkeleyi**, Rchb. in Gard. Chron. XVII. (1882), p. 537.

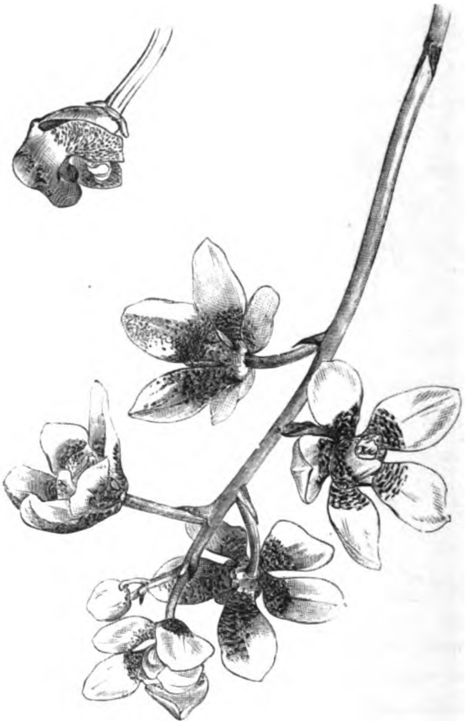
A very handsome species, discovered by Major-General E. S. Berkeley, as he himself informs us, in several islands in the Malay Archipelago. It is known in gardens under the name of *Thrixspermum Berkeleyi*, to which genus it was referred by Reichenbach, who first described it; but Thrixspermum being now merged into Sarcochilus, Loureiro's barbarous name will, it is to be hoped, disappear from orchid nomenclature.



Sarcochilus Berkeleyi.

S. Fitzgeraldi.

Stems very short, usually with 3—5 linear-oblong leathery leaves 3—5 inches long. Peduncles slender, drooping, longer than the leaves, 6—9 or more flowered. Flowers an inch in diameter, on white pedicels (and ovary) sheathed at the base by a small subulate bract; sepals and petals similar and sub-equal, spreading, oval, obtuse, white densely spotted with rose-purple towards the base; lip shorter than the other segments, saccate, three-lobed, the side lobes erect, roundish oblong, white spotted with rose-purple; the front lobe small, sub-conical, gibbous below, bright yellow. Column very short.



Sarcochilus Fitzgeraldi.

Sarcochilus Fitzgeraldi, F. Mul. Frag. VII. p. 115 (1870). Fitzgerald, *Orch. Austral. I.* part 2.

One of the rarest and most attractive of Australian orchids. It is dedicated by Baron Ferdinand von Müller, Director of the Botanic Garden at Melbourne, to the excellent monographer of Australian orchids, Mr. Robert Fitzgerald, of Sydney, who has given the following account of it:—" It was discovered by myself in a deep gorge of the mountains, at the head of the Billinger river, associated with a strangely proliferous form of *Dendrobium Kingianum* and clumps of *Sturmia* (*Liparis*) *reflexa*. It is found within the spray of the Naroo Falls and the surrounding streams, in masses, clinging to the dripping rocks and covering the black basalt with its green roots that stretch for yards over the smooth surface."*

We are indebted to Sir Trevor Lawrence, Bart., for materials for description and illustration.

S. Hartmanni.

Stems about 2 inches long, each with three—five leaves. Leaves hard and fleshy, linear-oblong, 3—5 inches long, obtuse, sometimes toothed at the apex. Peduncles stoutish, longer than the leaves, loosely racemose, many flowered. Flowers ½—¾ inch in diameter, on short white pedicels spotted with red, and sheathed at the base by a small triangular bract; sepals and petals white spotted at the base on both sides with red, the sepals oval-oblong, the petals similar but narrower; lip shorter than the other segments, saccate with two falcately oblong erect side lobes that are white striated with red-purple, and a small conical intermediate one with a two-lobed orange-yellow callus. Column very short.

Sarcochilus Hartmanni, F. Mul. Frag. VIII. p. 248 (1874). *Bot. Mag.* t. 7010. S. rubricentrum, Fitzg. in Gard. Chron. XIV. (1880), p. 38. Id. *Orch. austral.* II. part I. Thrixspermum Hartmanni, Rchb. in Gard. Chron. VII. (1877), p. 716.

Native of the mountain woods near Toowoomba, in Queensland, where it was discovered by the late Mr. Charles Hartmann, an amateur botanist of that settlement. It was subsequently detected by Mr. E. Ramsay, F.L.S., at Cairns, in the same colony. Its very stout, erect peduncles with longer racemes of differently coloured smaller flowers distinguish it from the closely allied *Sarcochilus Fitzgeraldi*.

S. luniferus.

"Leaves in the ordinary state of the plant, none. Roots very many, 3—5 inches long, flattened. Peduncles 1—2 inches long, stout, decurved, hispidulous, green, purple-spotted with two—three white, ovate, acute scales. Racemes drooping, many flowered. Flowers ½ inch in diameter; sepals and petals elliptic-oblong, obtuse, yellow spotted with orange-red; lip white, saccate with large erect, ovate, obtuse side lobes, a minute recurved mid-lobe, and two thick ridges on the papillose disk." (*Botanical Magazine*).

Sarcochilus luniferus, Hook. f. *Bot. Mag.* t. 7044. Id. Fl. Brit. Ind. VI. p. 37. Thrixspermum luniferum, Rchb. in Gard. Chron. 1868, p. 768. Id. Trans. Linn. Soc. XXX. p. 136.

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* *Australian Orchids*, loc. cit. supra.

A pretty and very curious orchid cultivated in the Royal Gardens at Kew. One of its most noticeable peculiarities is the absence of leaves in the ordinary state of the plant (a character it possesses in common with a few other species of Sarcochilus), although a few small leaves occasionally appear under cultivation. It was one of the numerous discoveries of the Rev. C. Parish, near Moulmein, and was introduced to British gardens by Messrs. Low and Co. in 1868. The specific name refers to the form of the labellum as seen in front.

S. purpureus.

Stems scandent, 2—3 feet long, as thick as an ordinary writing pencil, and from which are produced numerous white, cord-like, branching roots. Leaves linear-oblong, 3—4 inches long, sessile, bifid at the apex, keeled beneath. Racemes longer than the leaves, many flowered. Flowers crowded, about an inch in diameter, light rose-purple, the lip a little darker than the other segments; sepals and petals elliptic-oblong, the lateral sepals adnate to the base of the lip; lip shorter than the other segments, compressed and narrowed at the base, dilated towards the apex into a funnel-like tube with a narrow, oval aperture, below which is a whitish awl-shaped appendage.

Sarcochilus purpureus, Benth. in Gen. Plant. III. p. 576 (1883). Hook. f. Fl. Brit. Ind. VI. p. 36. Camarotis purpurea, Lindl. Gen. et Sp. Orch. p. 219 (1832). Id. *Sert. Orch.* t. 19. Id. in Journ. Linn. Soc. III. p. 37. Paxt. *Mag. Bot. VII.* p. 35. C. rostrata, Rchb. in Walp. Ann. VI. p. 881 (1864). Aërides rostratum, Roxb. Fl. ind. III. p. 474 (1832).

This pretty orchid first became known to science in the early part of the present century through Dr. Carey, who cultivated it in his garden at Serampore in Bengal, whence it was obtained by Dr. Wallich for the Calcutta Botanic Garden in 1819, and whose excellent drawing by a native artist was reproduced in Dr. Lindley's *Sertum Orchidaceum.** It was subsequently found wild in the forests of Sylhet and on the Khasia Hills; and from the last-named locality it was introduced to Chatsworth by Gibson in 1837. It flowered for the first time in this country in Messrs. Loddiges' nursery at Hackney in 1839. Although generally cultivated by orchid amateurs of the last generation under the name of *Camarotis purpurea,* it is but rarely seen in the orchid collections of the present time.

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* Still the best coloured plate of this orchid known to us.

AËRIDES.

Loureiro, Fl. cochinch. II. p. 523 (1790). Lindl. Gen. et Sp. Orch. p. 328 (1832). Benth. et Hook. Gen. Plant. III. p. 576 (1883).

The elegant drooping racemes of fragrant, wax-like flowers, and the comparative facility with which the species can be cultivated in the glass-houses of Europe, have always secured for Aërides a large amount of favour from orchid amateurs, so that in most collections the genus is represented by its most admired species. From a botanical point of view, however, it must be admitted that a more perplexing genus as regards the limitation of species is scarcely to be found throughout the ORCHIDEÆ, for it includes an unknown number of "forms," some of them perhaps natural hybrids, which in many instances approach each other so closely that it is extremely difficult to define clearly the differences that separate them, or to determine the specific characters by which the one may be distinguished from the other, if species they are, but nevertheless showing some characteristic in habit, in the inflorescence, or in the colour of the flowers, by which they are recognised as distinct by horticulturists. Many of these "forms" fall naturally into groups, each of which is represented by a well-recognised species that may be regarded as the type of the group; *Aërides odoratum, A. multiflorum* and *A. falcatum* are instances of such; around each of these well-marked species may be grouped a number of forms that can only be distinguished from the type by characters of scarcely sufficient value to be considered specific.

The essential characters of Aërides may be thus expressed:—

The *sepals* are spreading, the lateral two broader than the upper one, and adnate at their base to the foot of the column.

The *petals* are similar to the upper sepal, rarely different.

The *labellum* is affixed to the foot of the column, is three-lobed, and produced into a spur that is usually turned upwards on the back of the labellum.

The *column* is short and thickish, produced more or less at its base into a foot; the anther is beaked.

In a wild state the Aërides affix themselves to the trunks and branches of living trees, rarely to dead and prostrate ones. The young plants are usually erect or ascending, and emit from their base numerous cord-like roots that creep over the bark or along the cracks and crevices of it, clinging to the tree with extraordinary tenacity, and holding the plants so firmly as to enable them to resist any of the ordinary force of Nature that would affect their stability or cause their displacement. As the stems continue to lengthen, adventitious roots are constantly produced from the preceding year's growth, which attain a great length, frequently branch, and become pendent by their own weight. These roots thence form in time a tangled, cord-like mass that cannot be aptly compared with any phase of vegetation seen in our climate. The annual lengthening of the stem is well marked by the foliage, which in a wild state is of biennial duration; the roots too that are farthest removed from the foliage gradually cease to perform their functions and die off. The inflorescence is produced from the axils of the leaves of the preceding year, which begin to wither in the short, dry season that ensues after the growth of the current year is completed. As the stem of an Aërides lengthens by successive yearly growths it gradually deviates from its ascending position, first becoming more inclined, then taking a horizontal direction, and finally by its own weight and the weight of its appendages it is brought into almost an inverted or, if near enough to the ground, a prostrate position, when its further lengthening is checked or even arrested by the obstacles it encounters. Nevertheless, the stems of Aërides are virtually interminate, they would continue to lengthen indefinitely if no physical obstacles or checks intervened. Stems have been observed from 15—20 feet long, but long before that length has been attained young shoots spring from the base of the parent stem, which in time become independent plants; the stem also produces lateral shoots when a fracture has occurred, or when growth at the apex has been arrested by some physical cause. As the leaves wither the stem becomes lignified, sapless, and gradually loses all signs of life beyond a certain distance below the foliage; probably the life of no part of the stem under the most favourable circumstances exceeds five years.

Such is the general view of the most obvious period of the life history of an Aërides in its native home.* Many exceptional cases are doubtless to be met with, but in none that have come to our knowledge has the general law been greatly departed from.† Under the artificial conditions to which the Aërides are subjected in the glass houses of Europe, some modifications of the general law of their growth as sketched above are occasionally observable, especially in the longer persistence of the foliage and prolonged life of the stem.

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* The above general view of the life history of an Aërides is also applicable to Vanda, Saccolabium, etc., and other allied genera, with but some modification, and therefore will not be repeated under them.

† *Aërides japonicum* is a diminutive species, whose stem probably never exceeds a few inches in height under the most favourable circumstances; its life history is, however, essentially the same as that of other Aërides.

The species of Aërides admit of a division into two very distinct sections according to their vegetation and habit, viz., PLANIFOLIÆ, in which the leaves are flat, leathery, and spreading, and TERETIFOLIÆ, in which the leaves are cylindric, fleshy, and grooved in front. Of the last-named section two species only, *Aërides mitratum* and *A. Vandarum*, are known to us to be in cultivation. All the other cultivated forms belong to the flat-leaved section, throughout which a general uniformity of habit prevails, so that the following short diagnosis of the vegetative organs will serve for all:—

> The *stems* are cylindric, deviating but little in thickness from that of a man's little finger, ligneous below, leafy upwards, emitting long, cord-like, often branched, aërial roots.
>
> The *leaves* are strap-shaped, keeled beneath, embracing the stem at their base, obtuse or obliquely two-lobed at their apex, very leathery in texture.
>
> The *inflorescence* is lateral, either simple or branched, decurved and usually longer than the leaves; very viscid in the *odoratum* group from a honeyed secretion along the rachis and from the base and foot of the column.
>
> The *flowers* are often crowded and inverted, that is, the labellum is uppermost,[*] the pedicels are sheathed by a small scale-like bract at the base.

The genus was founded by the Portuguese missionary and botanist, Loureiro, upon *Aërides odoratum*, which he detected in Cochin-China some time prior to 1790, the year in which he published his *Flora cochinchinensis*. His selection of the name is explained by the following quaint extract from that work, which would be spoiled by translating:—"Mirabilis hujus plantæ proprietas est, quod ex sylvis domum delata et in aëre libero suspensa, absque ullo pabulo vegetabili, terreo vel aqueo, in multos annos duret, crescat, floreat et germinet. Vix crederem nisi diuturna experientia comprobassem." The name Aërides is a grammatical form called a patronymic, and means literally "children of the air."[†]

Geographical distribution.—The Aërides are spread generally over the Indo-Malayan region, excluding the arid tracts in the north-west of Hindostan and the dry central plateau of the Deccan, where the climatic conditions are unsuitable for orchid life. On the map illustrating the geographical distribution of Phalænopsis we have also inscribed the authenticated localities of the most important of the cultivated Aërides, from which a better idea of the distribution of the genus will be derived than can be conveyed by verbal description. From an inspection of the map it will be seen that closely-allied forms occur in localities remote from each other, a circumstance that tends far to show that such forms are but geographical deviations from a common type, and may in some measure account for the difficulty attending the botanical limitation of the species.

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[*] But owing to the pendulous habit of the inflorescence the flowers appear to the spectator in their natural position.

[†] The name itself is unknown in classic Greek, but it is correctly formed from ἀὴρ, ἀέρος, "the air," hence the proper pronunciation is ā-ĕr-ī′-dēs.

Cultural Note.—The Aërides should be cultivated in what is usually called the "East Indian house," where they may be associated with other orchids from the Indo-Malayan region. Although the mean temperature of that region is one of the highest observed in the world, it is found by experiment that most orchids brought thence to the high latitude of Great Britain thrive better in the glass-houses of this country in an average lower temperature than in a temperature raised by artificial heat to nearly the same mean as that of their native home. Thus, while the mean temperature for the whole year of parts of India and Malaysia, in which Aërides abound, is as high as 27° C. (80° F.), the temperature suited for them in the glass-houses of Great Britain should not be higher than 21°—24° C. (70°—75° F.) from March to October, the period during which the plants are in active growth, raised by sun-heat on bright days 6° C. (10° F.) higher, and reduced 3° C. (5° F.) by night, that is to say, to 18°—21° C. (65°—70° F.). In the winter months a night temperature of 15° —18° C. (60°—65° F.), raised a little higher in the daytime is sufficient. It is well known among cultivators that a high temperature maintained by fire-heat debilitates, while sun-heat strengthens the plants, hence a light shading only is necessary during the middle of the day in the summer months, while from October to March no shading is required. The ventilation must be regulated according to the season; the rule is — admit as much fresh air into the house as possible, and as often as it can be done without draughts and too rapid a lowering of the temperature of the house. A high degree of humidity must be maintained during the growing season by damping down and by the direct application of water to the plants; in winter the watering must be restricted to just so much as is sufficient to keep the sphagnum moist and to counteract the drying effects of the hot-water pipes. Pots are usually preferred, although teak baskets are used by some cultivators, especially when it is desired to grow the plants into large specimens; in either case they should be filled with clean, broken crocks to three-fourths of their depth, the larger and coarser pieces being placed at the bottom; some cultivators add pieces of charcoal, but we have never detected any advantage derived from its use. The drainage should be surfaced with living sphagnum that must be kept constantly moist. In January, or February at the latest, the old sphagnum should be removed and replaced by new, and those plants whose lowermost leaves have withered should be taken out of the pots and their stems cut back at the base so far as to allow the fresh leaves to be close to the sphagnum.

Thrips and scale are great enemies of Aërides; the first can be kept in check by fumigation and the use of tobacco powder, the latter by sponging with soft soap dissolved in tepid water.

SYNOPSIS OF SPECIES AND VARIETIES.

Aërides Augustianum.*

"Leaves arching, 6—7 inches long and 1¼ inch broad, dark green and unequally bi-lobed at the apex. Racemes arching, a little longer than the leaves. Flowers of a light rosy shade, 1—1¼ inch long; sepals and petals roundish oblong, obtuse; lip three-lobed, the side lobes falcate, oblong, rounded, or nearly truncate above, margin entire; the front lobe much longer, broadly oblong, margins crenulate, apex somewhat bilobed; spur longer than the front lobe, nearly straight." (R. A. Rolfe, in Gard. Chron. VII. s. 3 (1890), p. 9.).

Aërides Augustianum, Rolfe in Gard. Chron. loc. cit. and p. 233, icon. xyl.

Discovered in the Philippine Islands by M. Auguste Linden, to whom the species is dedicated, and recently introduced by the Societé anonyme d'Horticulture Internationale of Brussels.

A. crassifolium.

Leaves 6—7 or more inches long, and 1½—2 inches broad, unequally bi-lobed at the apex. Peduncles longer than the leaves, loosely racemose. Flowers 1 — 1½ inch across vertically; sepals oblong, obtuse, the lateral two the broadest, bright rose-purple, paler at the base; petals oval-oblong, coloured like the sepals; lip three-lobed, the side lobes semi-lunate or crescent-shaped and coloured like the sepals and petals; the intermediate lobe broadly ovate, obtuse, deep rose purple, at the base are two keels that are divergent in front; spur bent, compressed, greenish at the tip.

Aërides crassifolium, Rchb. and Parish in Trans. Linn. Soc. XXX. p. 145 (1873). Rchb. in Gard. Chron. VII. (1877) p. 596; VIII. p. 492, icon. xyl. Warner's *Sel. Orch. III.* t. 12. Godefroy's *Orchidophile*, 1885, p. 370. Hook. f. Fl. Brit. Ind. VI. p. 46.

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* Not seen by us.

A very handsome species introduced by Messrs. Low and Co., from Moulmein, through the Rev. C. S. Parish in 1864, but which did not flower in this country till several years afterwards, on the first occasion in 1872 in the collection of the late Mr. John Day, at Tottenham, and in the following year in that of the late Mr. Dodgson, at Beardsworth, Blackburn. It is very near *Aërides falcatum*, from which it is chiefly distinguished by its dwarfer and more robust stems, its broader and more leathery leaves, and its looser racemes of larger and differently coloured flowers.

A. crispum.

Stems usually dull violet-purple along the leafy part. Leaves spreading, 5—8 inches long, 1½—2 inches broad, bi-lobed at the apex with a small mucro between the lobes. Peduncles 3—5 times as long as the leaves, generally racemose, but sometimes branched. Flowers among the largest in the genus, with a pleasant pine-apple fragrance, nearly 2 inches across vertically, on short, partially twisted grooved pedicels; sepals and petals white lightly stained with rose-purple behind, and with a faint flush of the same near the apical end in front, oval-oblong, obtuse, the lateral sepals larger and the petals smaller than the dorsal sepal; lip three-lobed, the side lobes small, erect, roundish oblong, white, streaked with rose-purple on the inner side; the middle lobe broadly ovate, saddle-like, with serrate margin, rich amethyst-purple, and with a white grooved callus at the entrance of the saccate base; spur small, horn-like, compressed. Column white; anther yellowish.

Aërides crispum, Lindl. in Wallich's Cat. 7319. Id. Gen. et Sp. Orch. p. 239, (1832). *Bot. Reg.* 1842, t. 55. *Bot. Mag.* t. 4427. Van Houtte's *Fl. des Serres, V.* t. 438. *Illus. hort.* 1857, t. 123. Gard. Chron. 1859, p. 24, icon. xyl. Hook. f. Fl. Brit. Ind. VI. p. 45. A. Brookei, Batem. in Bot Reg. 1841, misc. No. 116. Paxt. *Mag. Bot. IX.* p. 145. Van Houtte's *Fl. des Serres, I.* p. 42.

var.—Lindleyanum.

Peduncles branched. Flowers somewhat larger than in the type, the dorsal sepal and petals tinted with light purple, the side lobes of the lip greenish, the middle lobe rich amethyst-purple bordered with white.

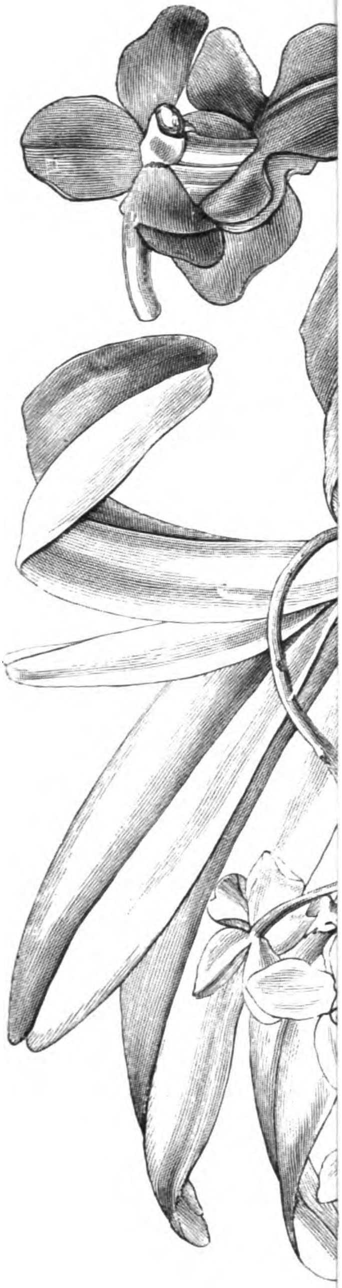
A. crispum Lindleyanum, supra A. Lindleyanum, Wight Ic. t. 1677. Lindl. in Jour. Linn. Soc. III. p. 41. Rchb. in Walp. Ann. VI. p. 897.

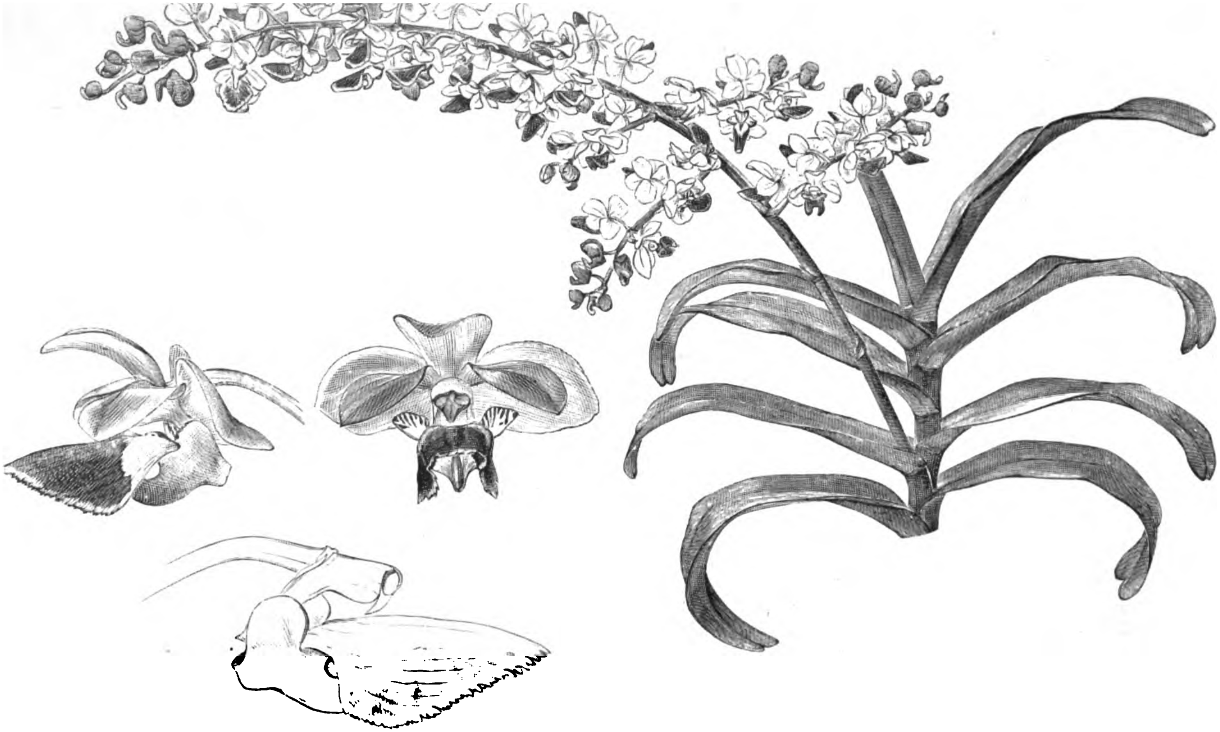
var.—Warneri,

Leaves ascending, shorter and narrower than in the type. Racemes longer with smaller flowers; sepals and petals white very faintly suffused with light rose-purple; lip deep rose-purple with a narrow white margin.

A. crispum Warneri, Williams' *Orch. Alb. VII.* t. 293. A. Warneri, Hort.

Aërides crispum was first discovered by Dr. Wallich, in the valley of Courtallum in the extreme south of India, in the early part of the present





Aërides crispum.

century, but it was not introduced into British gardens till many years afterwards. It flowered for the first time in this country in Sir Richard Brooke's collection at Norton Priory, in Cheshire, in 1841, on which occasion it received the name of *A. Brookei* from Mr. Bateman, who was unacquainted with Dr. Wallich's herbarium specimen which had been previously named *A. crispum* by Dr. Lindley. The variety *Lindleyanum*, a very fine form but now rarely seen, was detected by Dr. Wight on the Neilgherry Hills in the south of India about the year 1850, and was dedicated by him to the eminent orchidologist as a distinct species. The variety *Warneri*, also a rare form, first appeared in the collection of the late Mr. C. H. Warner, at Hoddesden, in 1857. To the *A. crispum* group may probably be added *A. illustre*, described by Reichenbach in the *Gardeners' Chronicle*, *XVIII.* (1882), p. 71, which had been introduced by Messrs. Low and Co. amongst an importation of *A. crispum*.

A. Emerici.

Leaves 9—12 inches long and 1—1½ inch broad. Racemes shorter than the leaves, sub-pendulous, the rachis viscid. Flowers an inch long, on pale purple, slightly twisted pedicels; sepals and petals broadly obovate-oblong, white with a light amethyst-purple blotch at the apex of each; side lobes of lip rounded, erect, spotted with purple inside at the basal end; the intermediate lobe very small, narrowly oblong, acute, deep amethyst-purple; spur funnel-shaped, incurved. Column very short.

Aërides Emerici, Rchb. in Gard. Chron. XVIII. (1882), p. 586. ***Bot. Mag.*** **t. 6728. Hook. f. Fl. Brit. Ind. VI. p. 47.**

Discovered by Major-General Emeric S. Berkeley in the Andaman Islands and introduced by him in 1882. It is also found on the small islets to the north of the Andamans known as the Coco Islands. It belongs to the group of which *Aërides odoratum* is the type, and is distinguished from that species chiefly by its longer racemes of smaller and differently-coloured flowers.

A. falcatum.

Leaves 6—8 inches long and 1¼—1½ inch broad, glaucescent above, striated with dark lines beneath. Racemes as long as or longer than the leaves. Flowers loosely arranged along the rachis, 1¼ inch long; sepals and petals white with a small light amethyst-purple apical blotch, broadly oval, the lateral sepals broader and the petals narrower than the dorsal sepal; lip three-lobed, the lateral lobes falcate or crescent-shaped, spreading, light amethyst-purple; the front lobe broadly obovate, somewhat saddle-shaped, emarginate with denticulate margin, and with two shallow median keels above, deep amethyst-purple; spur short, compressed, greenish.

Aërides falcatum, Lindl. in Paxt. Fl. Gard. II. p 142 (1852). Rchb. in Walp. Ann. VI p. 897. *Xen. Orch. I.* p. 220, t. 92. Gard. Chron. III. s. 3 (1888), p. 744. Hook. f. Fl. Brit. Ind. VI p 46. A. expansum, Rchb. in Gard. Chron. XVIII. (1882), p. 40. A. Larpentæ, Hort. A. Mendelii, Hort.

var.—Houlletianum.

Leaves a little longer and narrower. Racemes shorter and denser, the flowers smaller in all their parts, light tawny yellow with an apical purple spot on each segment, the margin of the front lobe of the lip fimbriate rather than denticulate, and the median keels shorter.

A. falcatum Houlletianum, supra. A. Houlletianum, Rchb. in Gard. Chron. 1872, p. 1194. Id. V. (1878) p. 756. *Xen. Orch. III.* t. 204. A. Picotianum, Hort. French.

var.—Leoniæ.

Leaves more distant. Flowers larger with front lobe of the lip a little broader; sepals and petals white with a small amethyst-purple apical spot, and some dots of the same colour towards the base of the petals and lateral sepals; the side lobes of the lip dotted and marked with light amethyst-purple, the central and apical area of the front lobe deeper purple, the remainder white dotted like the other segments.

A. falcatum Leoniæ, supra. A. expansum Leoniæ, Rchb. in Gard. Chron. XVIII. (1882), p. 40. Williams' *Orch. Alb. VII.* t. 328. A. Leoniæ, Godefroy's *Orchidophile*, 1885, p. 301 (Leonæi).

This species first became known to science and to horticulture in 1847, when a plant, whose origin is not recorded, flowered in the garden of Sir George Larpent, at Roehampton, and was exhibited by his gardener at the Chiswick Show of the Horticultural Society of London, under the provisional name of *Aërides Larpentæ,* the name by which it is still best known in many orchid collections. Five years later the species was described by Dr. Lindley in Paxton's *Flower Garden* as *Aërides falcatum,* and again in 1858 by Reichenbach in his *Xenia Orchidacea,* its origin being unknown to both botanists. It has since been imported under various names from Arracan and Upper Burmah. Its habitat is thence known, that of the typical *A. falcatum* being at no great distance from Akyab.

The variety *Houlletianum* first appeared in 1868 in the nursery of the late M. Lüddemann, at Paris, at whose request it was named by Reichenbach four years later when better materials for description were supplied from the same source, in compliment to M. Houllet, the Curator of the Jardin des Plantes. It flowered for the first time in this country in May, 1876, in the garden of Sir Trevor Lawrence, Bart., at Burford Lodge; the plant had been received in 1873 from Cochin China. The variety *Leoniæ* was received by Mr. H. J. Ross, of Castagnola, near Florence, in 1879, from Dr. Clement Williams, of Mandalay. It had been discovered the year before by Mr. Allan Goss, of Rangoon, in compliment to whose wife it was named. Two years later it became generally distributed among British collections.

A. Fieldingii.

Leaves 7—10 inches long, 1—1¾ inch broad, the lower ones deflexed, the upper ones spreading or slightly ascending. Peduncles 18—24 or more inches long, generally racemose, but sometimes branched near the base. Flowers crowded, 1½ inch across vertically; the dorsal sepal and petals obovate, obtuse, amethyst-purple suffused with white, but sometimes with the basal half white dotted with purple; lateral sepals broadly oval, white with a pale purple apical spot; lip nearly deltoid or trowel-shaped, much acuminated, slightly compressed laterally, with two small basal lobes rolled inwards over the mouth of the small, funnel-like, whitish spur, amethyst-purple mottled with white.

Aërides Fieldingii, Jennings' *Orch.* t. 20 (1875). *Belg. Hort.* 1876, t. 18-19, p. 225. Williams' *Orch. Alb. VII*, t. 309. De Puydt, *Les Orch.* t. 3. Hook. f. Fl. Brit. Ind. VI. p. 45. Aërides, "Fox Brush," Rchb. Allgem. Gartenz. 1855, p. 225.

var.—Williamsii.

Leaves longer and more deflexed. Racemes more dense. Flowers white with some purple markings at the base of the front lobe of the lip.

A. Fieldingii Williamsii, supra. A. Williamsii, Warner's *Sel. Orch. I.* t. 21.

Introduced by us through Thomas Lobb, in 1850, along with *Vanda cœrulea,* and subsequently exhibited by us at the principal metropolitan and other horticultural shows as the "Fox Brush" Aërides, a name whose origin we are unable to trace, but which evidently refers to the aspect of the inflorescence. It was afterwards named *Aërides Fieldingii* in compliment to Colonel Fielding, an officer in the Indian army, and curiously enough, although this name has been in use among horticulturists for upwards of forty years, it was not botanically recognised till accepted by Sir J. D. Hooker in the recently published part XVII. of his *Flora of British India,* the previously published descriptions and figures being exclusively confined to horticultural literature.

Its principal station is Shillong in north-east India and the adjacent hills, whence it has been occasionally imported since its first introduction. The variety *Williamsii*, which is extremely rare, was, Mr. Warner states, first imported by us with *Aërides Fieldingii* through Thomas Lobb. *A. Fieldingii* approaches very closely *A. multiflorum*, from which it is distinguished by its different habit, and especially by the much acuminated lip of its differently-coloured flowers.

A. Huttonii,

Leaves 7—10 inches long, ¾—1 inch broad. Racemes longer than the leaves. Flowers an inch long, rose-purple, the lip deeper coloured, the pedicels much paler; sepals and petals similar, broadly oblong, rounded at the apex; lip with a stout incurved, funnel-shaped spur, at the mouth of which are three erect lobes of which the middle one is the narrowest. Column short, anther yellow.

Aërides Huttonii, supra, and Hort. Veitch, 1867. Saccolabium Huttonii, Hook. f. *Bot. Mag.* t 5681.

Introduced by us through Henry Hutton in 1866. It was sent with other plants collected by him in the Malay Archipelago, which reached us after his early and lamented death without any indication of the locality. As only a few plants were received alive, *Aërides Huttonii* continued to be very rare in cultivation till 1882, when it was re-discovered by Curtis in north Celebes, growing on mangrove trees near the sea-shore. As a species it is distinct, and botanically interesting as connecting Aërides with Saccolabium; the characters of the labellum conforming more to the first than to the last-named genus it is here brought under it.

A japonicum.

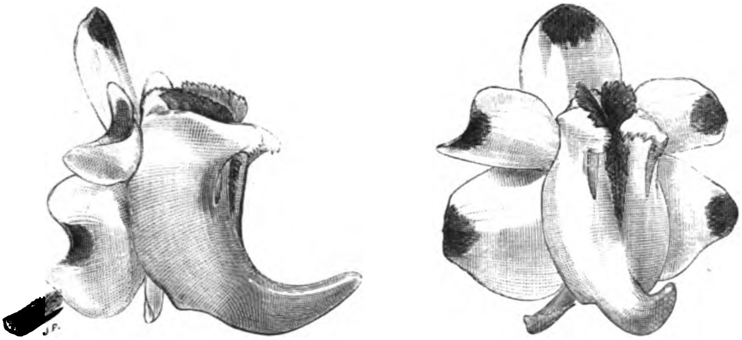
Stems very short. Leaves few, linear—rarely oval-oblong, 3—4 inches long. Peduncles longer than the leaves, loosely racemose, 7—10 flowered. Flowers fragrant, greenish white with some red bars on the basal half of the lateral sepals, and some amethyst-purple stains on the lip; sepals and petals oval-oblong, the petals a little smaller than the sepals; lip with two erect lobules at the base, first oblong, then broadly obovate with crenulate margin, and concave with a raised median ridge; spur funnel-shaped, half as long as the lip.

Aërides japonicum, Rchb. in Hamb. Gartenz. 1863, p. 210. *Bot. Mag.* t. 5798. *Illus. hort.* 1883, t. 461. Sô Mokou, XVIII. fol. 22, sub. Nago-ran.

First introduced from Japan by M. Linden, of Brussels, in 1862, and subsequently by ourselves. According to Franchet and Savetier* it grows on shrubs in the hilly districts of Kiusiu, and in other places. "The presence of Aërides in so high a northern latitude as Japan is a remarkable fact in botanical geography, testifying to the warmth of the southern coasts of that archipelago, and to the extension of a Malayan type of vegetation to so high a parallel.† The climatic influence of so high a latitude has, however, manifested itself in the diminished stature of the plant, which is the smallest Aërides known. The form of the labellum is peculiar in this species and distinctly separates it from every other.

A. Lawrenceæ.

Leaves 9—12 inches long, and 1½—2 inches broad. Racemes as long as or longer than the leaves. Flowers fragrant, of wax-like texture, the largest of the *odoratum* type; sepals and petals white with a rich amethyst-purple apical blotch, the upper sepal and petals oval-oblong, the lateral sepals much broader, broadly oval; lip prolonged at the base into a horn-like, incurved, green spur, deeply three-lobed, the side lobes somewhat hatchet-shaped with denticulate margin, white, the intermediate lobe oblong with dentate margin, rich amethyst-purple, the colour sometimes prolonged between the side lobes as far as the green tip of the spur.



Aërides Lawrenceæ.

Aërides Lawrenceæ, Rchb. in Gard. Chron. XX. (1883) p. 460. Williams' *Orch. Alb.* VI. t. 270. *The Garden, XXXV.* (1889), t. 702.

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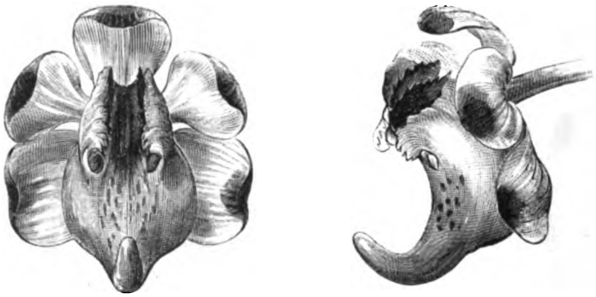
* Enum. Pl. jap. II. p. 29, but these authors have confused it with *Angræcum falcatum*, and although they have quoted the figure of this plant in *Sô Mokou*, they omit that of *Aërides japonicum* given in fol. 22.

† Bot. Mag. sub. t. 5798.

sub-var.—*Sander's* (Gard. Chron. XXII. (1884) p. 134), flowers pale fawn-yellow with the same parts amethyst-purple as in the type, the side lobes of the lip deeper yellow and spotted with purple on the front side.

Aërides Lawrenceæ was introduced by Messrs. Sander and Co. from the Philippine Islands in 1883, through their collector, Roebelin, and shortly afterwards by ourselves through our collector, David Burke. Its habitat is in south-east Mindanao, where it is abundant, especially around Davao, growing on the trees in light shade, but sometimes quite exposed. It is often associated with *Vanda Sanderiana* and *Phalænopsis Sanderiana,* and these three noble orchids have even been observed growing together on the same tree. Sander's sub-variety, for it differs in nothing except colour, was introduced at the same time as the species.



Aërides Lawrenceæ, Sander's variety.

This Aërides approaches very closely the typical *Aërides odoratum,* the most obvious difference being the longer racemes loaded with larger flowers in which the purple spots are much brighter. It is appropriately dedicated to Lady Lawrence, wife of the respected President of the Royal Horticultural Society.

A. Leeanum.

Leaves 7—9 inches long and 1½ inch broad. Peduncles as long again as the leaves, racemed and pendulous along the distal half. Flowers less than an inch long, on pale rose-purple pedicels; sepals broadly oval-oblong, obtuse, rose-purple, white at the base; petals oval, smaller than the sepals but coloured like them; lip small for the genus, three-lobed, the side lobes rotund, incurved, almost enclosing the small intermediate lobe in front; the intermediate lobe ovate-triangular, deep purple;

spur straight, longer than the side lobes, green tipped. Column with a very short foot.

Aërides Leeanum, Rchb. in Gard. Chron. XV. (1881), p. 656.

A species or "form" whose origin has not been divulged, with the habit of *Aërides Quinque-vulnera* but apparently allied to *A. Thibautianum* (Rchb. Gard. Chron. 1866, p. 100), which we have been unable to identify with any of the forms known to us in cultivation. It was introduced by Messrs. Low and Co. some time prior to 1881, and is named in compliment to Mr. Lee, from whose collection at Downside, since dispersed, materials for description were sent to the late Professor Reichenbach.

A. maculosum.

Leaves 6—9 inches long, and $1\frac{1}{4}$—$1\frac{3}{4}$ inch broad. Peduncles longer than the leaves, usually branched near the base. Flowers about $1\frac{1}{2}$ inch long; sepals and petals oval-oblong, white at the base, the remaining area stained and spotted with amethyst-purple; lip with a broad claw, on each side of which is a small auricle; blade nearly flat, ovate-oblong, obtuse, entire, amethyst-purple, paler at the margin, and with two small white tubercles at the base, the claw and its auricles white streaked with purple; spur short, horn-like, incurved, green tipped. Column white; anther yellowish.

Aërides maculosum, Lindl. in *Bot. Reg.* 1845, t. 58. Paxt. *Mag. Bot. XII.* p. 49. Hook. f. Fl. Brit. Ind. VI. p. 451. Saccolabium speciosum, Wight. Icon. Pl. Ind. or t. 1674—75 (1852).

var.—Schroederi.

Stems more robust and taller. Leaves more distant and longer; peduncles stouter and more branched, the sepals and petals narrower with the apical stain larger and brighter, the front lobe of the lip longer and of a deep amethyst-purple.

A. maculosum Schroederi, Henfrey, in Garden Mag. Bot. XI. p. 121, icon. xyl. Linden's *Pesc.* t. 33.

A native of the Western Ghauts of India, from Mahabaleshwar, its northern limit, to Travancore in the south, but quite local, in one or two places associated with *Aërides crispum.* It was introduced by Messrs. Loddiges, of Hackney, and Messrs. Rollisson, of Tooting, and flowered for the first time in this country in the nurseries of those firms in July, 1844. The variety first appeared some years later in the collection of Mr. J. H. Schroeder, at Stratford Green. Both the type and the variety are still comparatively rare in British collections.

As a species its nearest affinities are *Aërides multiflorum* and *A. crispum*, between which it is intermediate, but approaching nearer the first named; the flowers are smaller than those of *A. crispum*, with the almost flat labellum of *A. multiflorum*.

A. mitratum.

Stems very short in the cultivated plants, bearing at their apex three—five or more semi-terete leaves 7—15 inches long, deeply channelled on the upper side. Racemes usually from below the leaves and shorter than they, ascending or sub-erect, many flowered. Flowers ¾ inch long, shortly pedicelled; sepals and petals sub-equal, broadly oval-oblong, white tinted with mauve-purple at the apex; lip "broadly trulliform, obtuse with a horn-like projection on each side at the base," amethyst-purple; spur short, much compressed, projecting backwards, mitre-shaped.

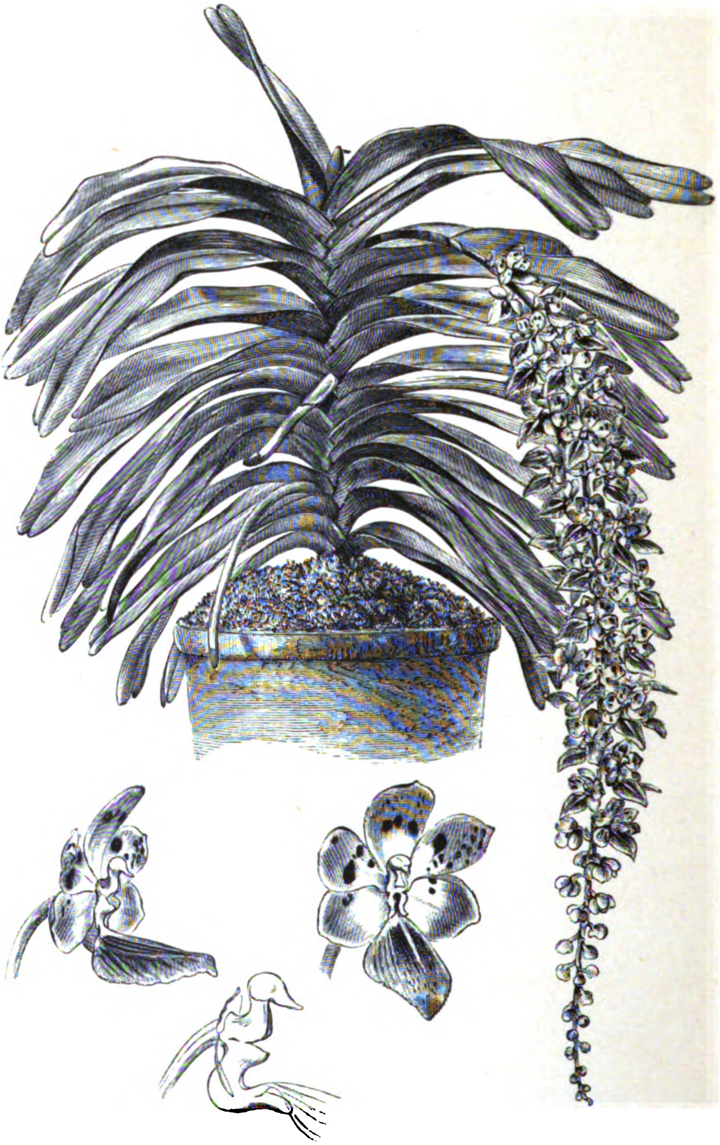
Aërides mitratum, Rchb. in Bot. Zeit. 1864, p. 415. Id. in Gard. Chron. I. s. 3 (1887), p. 834. *Bot. Mag.* t. 5728.

An attractive species, first introduced by Messrs. Low and Co., in 1864, from Moulmein, through the Rev. C. S. Parish. A single plant only survived the voyage, which was acquired by the late Mr. John Day, in whose collection at Tottenham it flowered for the first time in April, 1868. The plant subsequently died and the species became lost to cultivation till the autumn of 1886, when it was re-introduced by Mr. Shuttleworth, of Clapham, and shortly afterwards by Messrs. Sander and Co., through their collector Försterman. The specific name refers to the fancied resemblance of the spur of the lip to a bishop's mitre; its tapering cylindric leaves place it in the section TERETIFOLIÆ.

A multiflorum.

Leaves 7—9 inches long, ½—¾ inch broad. Peduncles longer than the leaves, racemose, but sometimes branched near the base. Flowers ¾ inch long, the upper sepal and petals oval-oblong, the basal area white with 2—3 or more purple spots, the apical area light amethyst-purple; the lateral sepals broader, sub-orbicular, white with a faint light purple stain; lip cordate obtuse, slightly convex above, light amethyst-purple, deeper along the middle; spur short, straight, compressed laterally. Column with two rounded auricles on the foot.

Aërides multiflorum, Roxb. Pl. of the coast of Coromandel III. p. 68, t. 271 (1819). Id. Fl. ind. III. p. 475. Rchb. in Walp. Ann. VI. p. 896. Morren. Belg. Hort. 1876, p. 286. Hook. f. Fl. Brit. Ind. VI. p. 44. A. affine, Wallich's Cat. No. 7316. Lindl. Gen. et Sp. Orch. p. 239 (1832). Id. *Sert. Orch.* t. 15. Id. in Journ. Linn. Soc. III. p. 41. *Bot. Mag.* t. 4049. De Puydt, *Les Orch.* t. 2. A. roseum, Paxt. *Fl. Gard. II.* t. 60 (1852). *Illus. Hort. III.* t. 88 (1856). Warner's *Sel. Orch. III.* t. 22 (superbum). A. trigonum, Klotzsch in Allgem. Gartenz. 1855, p. 177.



Aërides multiflorum, var. Lobbii.

var.—Godefroyanum.

Leaves complicate, longer and more leathery. Flowers somewhat larger with broader segments that are more brightly coloured.

A. multiflorum Godefroyanum, supra. A. Godefroyanum, Rchb. in Gard. Chron. XXV. (1886) p. 814. Godefroy's *Orchidophile*, 1887, p. 241.

var.—Lobbii.

Stem usually shorter, the leaves much crowded, lying almost flat one upon the other; peduncles much longer, with one—two branches; flowers more numerous and more richly coloured.

A. multiflorum Lobbii supra. A Lobbii, *Illus. hort. XV.* (1868), t. 557. Williams' *Orch. Alb. I.* t. 21.

var.—Veitchii.

As compared with var. *Lobbii*; the leaves are more distant and more spreading, the racemes shorter with more branches; the flowers lighter in colour; sepals and petals white dotted with rose at the apical end; lip light rose-purple.

A. multiflorum Veitchii, Morren. in *Belg. hort.* 1881, p. 123. A. Veitchii, De Puydt, *Les Orch.* t. 4.

With the exception of *Aërides odoratum, A. multiflorum* is the most widely distributed of all the East Indian species. It occurs in the lower valleys of the Himalaya, from Kumaon to Assam, and thence spreads southwards into Lower Burmah, where it is one of the commonest orchids of the country. It has also been gathered at Mergui, in the Andaman Islands, and in Cochin China.

Aërides multiflorum first became known to science towards the end of the last century, when it was discovered in Sylhet by Dr. William Roxburgh, the first Director of the Botanic garden at Calcutta, and many years afterwards near Sheopore, in Nepal, by his successor, Dr. Wallich.* It was introduced to British gardens by Messrs. Loddiges, in whose nursery, under the name of *A. affine*, it flowered in 1837. The variety *Godefroyanum* was introduced from Saigon, in Cochin China, by the well-known orchidist of Argenteuil, near Paris, whose name it bears; the plant is very distinct in foliage from the Indian type, but the flowers are structurally identical. The variety *Lobbii*, the handsomest and most generally cultivated of all the *multiflorum* forms, was introduced by us from Moulmein in 1851, through Thomas Lobb. The variety *Veitchii* was also introduced from Moulmein through Lobb along with the variety that bears his name, of which it is presumably a seminal form;

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* Sert. Orch. sub. t. 15.

it is extremely rare. The form cultivated under the name of *A. roseum* has not even a varietal character to distinguish it from the type.

A. odoratum.

Leaves 6—8 inches long and 1½—2 inches broad. Racemes nodding, as long as or longer than the leaves. Flowers an inch long, fragrant; sepals and petals oval-oblong, obtuse, white with an amethyst-purple apical blotch, the lateral sepals broader, and the petals narrower than the dorsal sepal; lip funnel-shaped, prolonged at the base into a horn-like spur, three-lobed, the side lobes erect, roundish oblong, white, sometimes with a faint tinge of light purple, and some scattered purple spots; the intermediate lobe small, linear oblong with denticulate but sometimes entire margin, white with a broad purple median band.

Aërides odoratum, Lour. Fl. cochinch. p. 525 (1790). Lindl. Gen. et Sp. Orch. p. 239 (1832). Id. Journ. Linn. Soc. III. p. 41. *Bot. Mag.* t. 4139. Regel's *Gartenfl. VI.* t. 272. Hook. f. Fl. Brit. Ind. VI. p. 47. **A. cornutum,** Roxb. Fl. ind. III. p. 472 (1832). *Bot. Reg.* t. 1485. **A. Dayanum,** Hort.

var. birmanicum.*

Flowers smaller, the apical blotch on the sepals reduced to light purple lines, the middle lobe of the lip narrower with a few teeth at the margin.

A. odoratum birmanicum Rchb. in Gard. Chron. II. s. 3. (1887), p. 272.

The longest known and the most widely distributed of all the Aërides, the species upon which the genus was founded, and the first that was brought under cultivation in the glass-houses of Europe. It was introduced to the Royal Gardens at Kew in the year 1800 from China, it is said, but more probably from Cochin China in which country it had been discovered a few years previously by Loureiro. It was subsequently obtained from Dacca by Dr. Roxburgh, and later from Noakote, in Nepal, by Dr. Wallich, who sent it to the Horticultural Society of London, in whose garden at Chiswick it flowered in the summer of 1831, and it has been in cultivation ever since. It is widely dispersed over north-east India, Burmah, and the eastern peninsula. Many localities are recorded in which it has been gathered, and its fragrant flowers are everywhere noted as being an especial attraction both to natives and strangers. The variety *birmanicum* was recently introduced by Messrs. Low and Co. through their collector Boxall. Another variety, in which the middle lobe of the lip has a bi-cuspidate tip, is preserved in herbaria.

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* Not seen by us.

A. Quinque-vulnera.

Leaves 9—12 inches long, 1—1½ inch broad, complicate at base, unequally bi-lobed at the apex. Racemes usually longer than the leaves. Flowers somewhat less than an inch across vertically; the dorsal sepal and petals similar and equal, oval-oblong, obtuse, white with a bright amethyst-purple apical blotch and some purple dots scattered over the remaining area; the lateral sepals broadly oval or sub-orbicular, similarly coloured; lip three-lobed, prolonged at the base into an incurved, horn-like, green spur; the side lobes erect, triangulate-oblong, rotund in front, white faintly dotted with purple; the intermediate lobe oblong with revolute and denticulate side margins, deep amethyst-purple. Column white.

Aërides Quinque-vulnera, Lindl. Sert. Orch. t. 30 (1830) (quinquevulnerum). Paxt. *Mag. Bot. VIII.* p. 241 (1841). Jenning's *Orch.* t. 30. A. Fenzlianum, Rchb. and A. jucundum, Rchb. ex Morren. Belg. hort. 1876, p. 289.*

Discovered by Cuming during his mission to the Philippine Islands, 1836—40, and sent by him to Messrs. Loddiges, in whose nursery at Hackney it flowered for the first time in this country in August, 1837. It grows upon trees in the hot valleys in the neighbourhood of Manila, whence it has been occasionally imported since its first introduction. The specific name, literally "five wounds," refers to the apical spots on the three sepals and two petals, which in this species are usually very distinct and bright in colour.

A. radicosum.

Leaves 7—10 inches long, ¾—1¼ inch broad. Peduncles stoutish, ascending, as long as the leaves, racemed, rarely branched, dull purple and furrowed along the rachis. Flowers on pale rose-purple pedicels, ¾ inch across vertically; sepals and petals broadly oval, the lateral sepals the largest, light rose-purple spotted with deep purple; lip three-lobed, the side lobes very small, rotund, erect, coloured like the sepals and petals, the middle lobe oblong, acute, deep rose-purple; spur horn-like, short and compressed laterally. Column with two small rounded whitish wings below the stigma.

Aërides radicosum, A. Rich. in Ann. Sc. nat. XV. p. 65 (1841). Hook. f. Fl. Brit. Ind. VI. p. 46. A. rubrum, Hort. Saccolabium Wightianum, Lindl. Gen. et Sp. Orch. p. 221 (1832). Rchb. in Walp. Ann. VI. p. 884. Wight, Icon. Pl. Ind. or. t. 917. S. rubrum, Wight, Icon. t. 1673 (not Lindl.). S. ringens, Lindl. Gen. et Sp. Orch. p. 221. Id. in Journ. Linn. Soc. III. p. 36.

First discovered in southern India by Heyne, and afterwards on the Pulney Hills, and at Quilon by Dr. Wight, and again later near Ootacamund by Perrotet, a botanist attached to the French Ministry of Marine, from whose specimens it was figured and described by Achille Richard under the name adopted above, which is the oldest published name under the right genus. We find no record of its first introduction into British gardens, in which it is better known as *Aërides rubrum.*

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* To *Aërides Quinque-vulnera* may also probably be referred *A. Roebelini* (Rchb. in Gard. Chron. XXI. (1884), p. 510) and *A. marginatum* (Id. XXIII. (1885), p. 533).

A. Savageanum.

Leaves 7—9 inches long, 1—1¼ broad. Racemes as long as the leaves. Flowers less than an inch across vertically; sepals oval-oblong, the basal half white dotted and stained with crimson-purple, the apical half crimson-purple; petals similar but narrower; lip deep crimson-purple, with a greenish spur that is quite straight, the side lobes roundish oblong, erect; the intermediate lobe small, linear-oblong, incurved with denticulate margin.

Aërides Savageanum, Hort. Sander.

The Aërides described above was acquired by us at a sale under the above name, and flowered in our houses in the summer of 1890. We are unable to refer it to any species known to us; we can find no scientific authority for the name nor any record of its origin and introduction. It is very distinct as regards the colour of its flowers, which are the darkest we have yet seen in the genus.

A. suavissimum.

Leaves 7—9 inches long, and 1¼—1½ inch broad. Racemes nearly as long again as the leaves. Flowers very fragrant, somewhat crowded, on purplish pedicels (including ovary) an inch long; sepals and petals spreading, white suffused with pale lilac, and with a rose-lilac apical blotch, the dorsal sepal broadly oval, the lateral two larger, subquadrate; petals like the dorsal sepals but smaller; lip prolonged at the base into a horn-like spur, three-lobed, the side lobes erect, oblong-rotund, buff-yellow spotted with purple, the middle lobe much smaller, linear-oblong with denticulate margin, paler in colour than the side lobes.

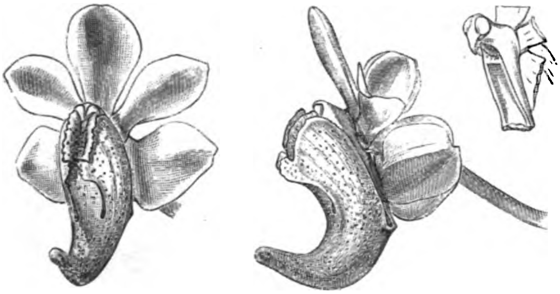
Aërides suavissimaum, Lindl. in Journ. Hort. Soc. Lond. IV. p. 264 (1849). Id. *Paxt. Fl. Gard. II.* t. 66. Rolfe in Gard. Chron. VII. s. 3 (1890) p. 43. Hook. f. Fl. Brit. Ind. VI. p. 47. A. flavidum, Lindl. in Paxt. Fl. Gard. II. p. 101 (1852). A. Reichenbachianum, Linden in Koch and Fintelmann's Wochenschrift, 1858, p. 61. Rchb. *Xen. Orch. II.* t. 104. A. nobile Warner's *Sel. Orch. I.* t. 11 (1862). Regel's *Gartenfl.* 1870, t. 641. A. Rohanianum, Rchb. in Gard. Chron. XXI (1884), p. 206.

var.—Ballantineanum.

Racemes shorter, fewer flowered, and appearing earlier in the year. Flowers somewhat smaller; sepals and petals white with an amethyst-purple apical blotch on each; the side lobes of the lip tawny yellow dotted with purple, the front lobe light purple, the spur white dotted with purple.

A. suavissimum Ballantineanum, Hook. f. Fl. Brit. Ind. VI. p. 47 (1890). A. Ballantineanum, Rchb. in Gard. Chron. XXIV. (1885), p. 198.

Although one of the most generally cultivated of the genus, the geographical distribution of *Aërides suavissimum* is very imperfectly known. It was first introduced from the Straits of Malacca by Messrs. Loddiges, in whose nursery it flowered in 1849, and it has since been imported by several horticultural firms, but we find no locality recorded besides the vague one given by Dr. Lindley here quoted from the Journal of the Horticultural Society of London.* Its affinity to *A. odoratum* is so near that more definite characters are wanted to distinguish it from that species than the structure of the flower affords. From a horticultural point of view, however, it is abundantly distinct from *A. odoratum* in its much longer racemes of smaller and differently coloured flowers that are produced later in the season. The variability of *A. suavissimum* was observed soon after its introduction, but the forms that have received distinguishing names represent differences too trivial to require separate description. The most distinct deviation from the type with which we are acquainted is the variety described above, which has been named in compliment to Mr. Ballantine, the excellent gardener to Baron Schroder, at The Dell, near Staines.



Aërides suavissimum.

A. Vandarum.

Stems terete, slender, somewhat flexuose, several feet long. Leaves terete, slender, 6—8 inches long, acuminate, with a shallow sunk line on the upper side. Flowers solitary or in short 2—3 flowered racemes, white, 2 inches across vertically; sepals and petals of semi-transparent texture, the sepals obovate-oblong, much undulated, the petals spreading, subrhomboidal, much broader; side lobes of the lip linear-falcate, acuminate, unequally toothed at the apex, and bearing a small toothed lobe near the inner base; middle lobe bent downwards, broadly obcordate with crenulate margin, clawed, the claw with three elevated short plates; spur subulate, terete, ¾ inch long.

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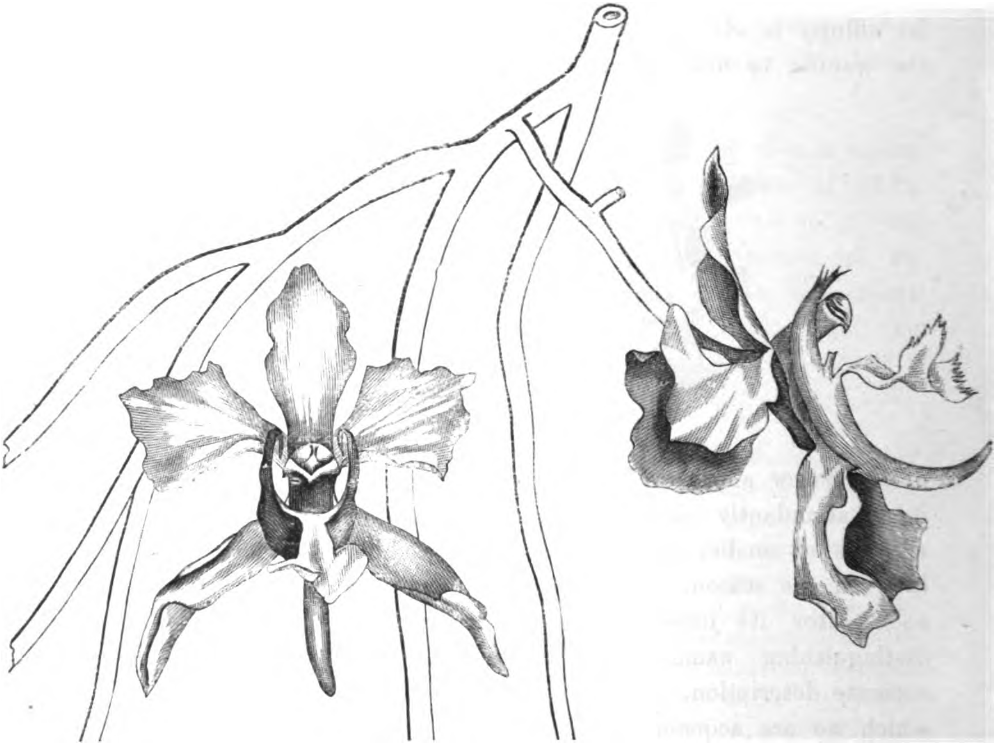
* F. W. Burbidge saw it growing luxuriantly in Singapore, but it may have been an introduced plant there. (*Gardens of the Sun*, p. 18).

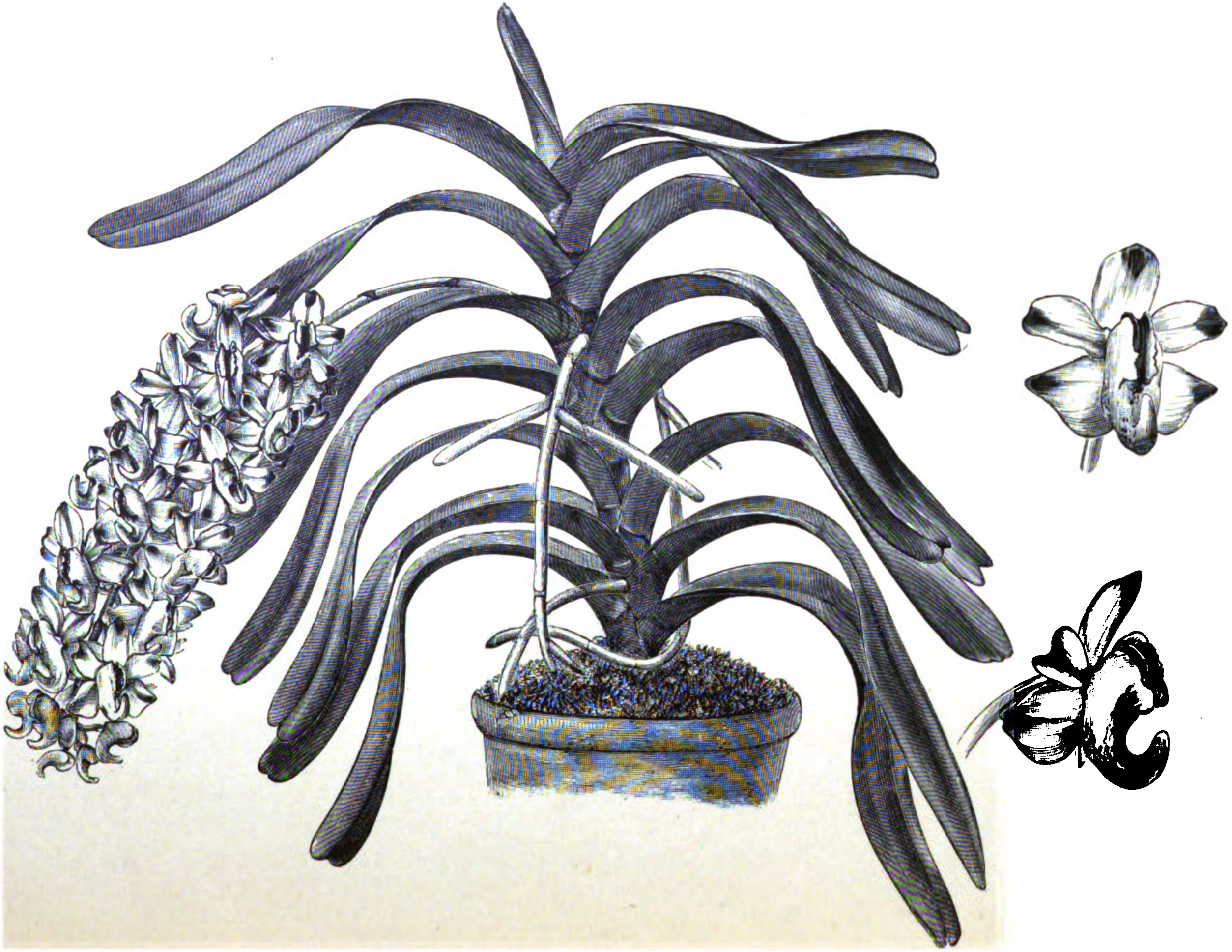
Aërides Vandarum, Rchb. in Gard. Chron. 1867, p. 997; III. (1875), p. 591; XXIV. (1885), p. 629, icon. xyl. Williams' *Orch. Alb. III.* t. 116. Hook. f. Fl. Brit. Ind. VI. p. 44. A. cylindricum, Hook. *Bot. Mag.* t. 4982 (not Lindl). Lindl. in Journ. Linn. Soc. III. p. 41 (Sikkim plant). Gard. Chron. III. (1875), p. 537, icon. xyl.



Aërides Vandarum.

(From the *Gardeners' Chronicle.*)

The earliest notice we find of this singular Aërides occurs in the *Botanical Magazine* of 1857, tab. 4982, where it is figured and described under the name of *Aërides cylindricum,* a species with a very different labellum, which had been discovered in southern India in the early part of the present century, and which is not,



Aërides virens

so far as we are aware, in cultivation. The materials for figuring were supplied by Mr. Parker, of Hornsey, in whose nursery it flowered in February, 1857, and this was probably the first occasion of its flowering in this country.

Aërides Vandarum occurs in the Sikkim Himalaya, at 5,000 feet elevation; also on the Khasia Hills at 4—5,000 feet elevation, and in Munipur at about the same altitude. It is thence a sub-tropical plant, a circumstance of which cultivators should take note.

A. virens.

Leaves 7—10 inches long and 1—1¼ inch broad. Peduncles longer than the leaves, racemose along the distal two-thirds. Flowers fragrant, exceeding an inch across vertically; sepals and petals broadly oval, obtuse, white with a bright purple apical blotch, the lateral sepals broader and the petals narrower than the dorsal sepal; lip somewhat resembling a ram's horn, deeply three-lobed, the side lobes much the largest, oblong, erect with the outer margin appressed to the column, white spotted with purple below and around the green-tipped spur; the front lobe small, oblong, entire, but sometimes bi-dentate at the apex, incurved towards the beak of the anther, sometimes wholly purple, sometimes white with a median purple band.

Aërides virens, Lindl. in Bot. Reg. 1843, misc. No. 48. *Id.* 1844, t. 41. Paxt. Fl. Gard. II. sub. t. 66. Williams' *Orch. Alb. IV.* t. 160. *Id. VII.* t. 298 (Ellisii).

Introduced in 1843 by Messrs. Loddiges from Java, where it is one of the commonest of orchids. Around Batavia it has established itself on the Tamarind trees that were planted by the early Dutch settlers to shade the roads. During the short dry season these trees lose some of their foliage, the Aërides are then partially exposed to direct sunlight, but during the remainder of the year they are in shade.

Compared with *Aërides odoratum,* of which *A. virens* is scarcely other than a geographical form — the leaves are generally (not always) a little longer and narrower, more distant and more decurved; the racemes are longer with the flowers more distantly placed along the rachis; the flowers are a little larger with larger and brighter purple spots.

RENANTHERA.

Loureiro, Fl. cochinch. II. p. 521 (1790). Lindl. Gen. et Sp. Orch. p. 217 (1832). Benth. et Hook. Gen. Plant. III. p. 577 (1883).

Renanthera includes five or six species, natives of tropical Asia and the Malay Archipelago, of which the two here described are well known in cultivation.* The only other species known to us to have been in cultivation, but which seems to have been long since lost, is *Renanthera micrantha* (erroneously figured in the *Botanical Register*, 1843, t. 41, as *R. matutina*), which was sent by Cuming from the Philippine Islands, and flowered at Chatsworth in December, 1842. The structure of the column, and especially of the pollinary apparatus of Renanthera, indicates a close affinity with Aërides and Vanda, to one or other of which most of the species except the type were in the first place referred, but the different form of the perianth, more particularly the lateral sepals, which are usually longer than the other segments and are parallel or nearly so, clearly distinguishes Renanthera from both those genera. The generic name, from *ren*, "a kidney," and *anthera*, refers to the kidney-shaped pollinia, but that form is by no means peculiar to this genus.

Renanthera coccinea.

Stems cylindric, as thick as the little finger, 7—10 or more feet long, leafy upwards. Leaves oblong, 4—5 inches long, amplexicaul, obliquely emarginate and very leathery. Panicles from opposite one of the upper leaves, 2—3 feet long and bearing from 100 to 150 flowers; bracts scale-like, roundish ovate, brownish red. Flowers 3½ inches across, vertically; upper sepal and petals linear-spathulate, bright red spotted with yellow, the petals a little narrower and shorter than the sepal; lateral sepals clawed, oblong, lobate on the inner side near the base, deep vermilion-red; lip small, sessile on the base of the column, with a conical saccate spur beneath, three-lobed, the side lobes erect, truncate, pale yellow streaked on the inner side with red; the intermediate lobe ovate, acuminate, reflexed, deep red with a pale yellow bi-lamellate callus at the base. Column terete, wingless, deep red.

Renanthera coccinea, Lour. Fl. cochinch. II. p. 637 (1790). Lindl. in *Bot. Reg.* t. 1131 (1828). Id. Gen. et Sp. Orch. p. 217. *Bot. Mag.* t. 2997-8 (1830). Paxt. *Mag. Bot. IV.* p. 49 (1838). Warner's *Sel. Orch. II.* t. 37. Hook. f. Fl. Brit. Ind. VI. p. 48.

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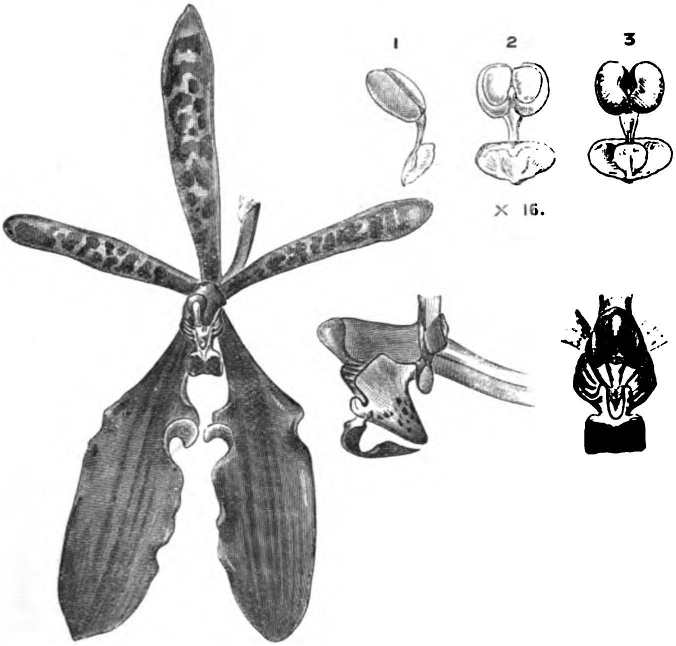
* The essential characters of the genus will be readily derived from the descriptions of these two species.

This grand old orchid, one of the earliest of the Asiatic epiphytal species cultivated in the glass-houses of Great Britain, was introduced some time previous to 1817, but owing to the imperfect treatment to which it was subjected in those early days of orchid cultivation, resulting from the crude ideas that then prevailed respecting the epiphytal character of the plants, it could not be induced to flower till 1827. In that year Mr. Fairbairn, the gardener at Claremont, brought a plant into flower by tying moss around the stems, which he kept constantly moist, and at the same time exposed the whole plant as much as possible to direct sunlight. This is the first recorded instance of its flowering in this country; three years later it flowered in the garden of Earl Fitzwilliam at Wentworth Woodhouse, near Sheffield, and subsequently at Chatsworth and in other collections, the occasion of its flowering being always regarded as an exceptional one and deserving of especial notice on account of the difficulty of inducing the plant to produce its gorgeous panicles. Even at the present time the difficulty of flowering *Renanthera coccinea* regularly



Renanthera coccinea.

has not been generally overcome, of which the cultural experience of it recorded in the horticultural press during the past twenty-five years affords ample evidence.

Renanthera coccinea is the typical species upon which the genus was founded by the Portuguese missionary and botanist, Loureiro, who described it in his *Flora cochinchinensis*, published in 1790, but in terms so brief and with such a peculiarity of diction that it was overlooked by botanists till it flowered in the glass-houses of Europe, when its extraordinary inflorescence attracted general attention. It is in high repute in its native country, where it is frequently trained to verandahs and other suitable places. It is also a great favourite with the Chinese of the southern provinces of the empire, by whom it has been assiduously cultivated from time immemorial, and among whom it is probably an introduced plant; its flowers are frequently introduced by them into the quaint but generally faithful drawings which they employ for various artistic purposes.

The only known stations of the plant are the Moscos Islands, opposite Tavoy and Cochin China.

Cultural Note.—Renanthera coccinea is one of those orchids that require a special treatment to induce it to flower regularly, and in the numerous communications to the horticultural press respecting it during the past twenty-five years there is expressed a general concurrence in its being a refractory plant, and details are given of the various methods employed by different cultivators to overcome the difficulty. As our space does not permit us to quote these various methods, each of which may be suitable for its own case, we can only refer to one of the most successful instances known to us.

At Chatsworth this orchid has been successfully cultivated for more than half-a-century.* The plants are placed on the west side of the large conservatory fully exposed to the sun after 1 p.m. Pieces of the stems about a foot long, having a few roots, are attached to poles of the Silver Birch 8—12 feet long and about 6 inches in diameter with the bark on; these poles are fixed perpendicularly in a border, no potting material whatever being used for the plants. As the stems increase in length the new aërial roots emitted by them soon attach themselves firmly to the birch poles. From the beginning of May to the end of September fire heat is dispensed with; the temperature of the house being entirely controlled by the state of the weather is thence subject to great fluctuations, thus on bright days it frequently rises to 32° C. (90° F), notwithstanding the greatest possible amount of ventilation is used; in dull weather it sinks to 13° C. (55° F.), while in changeable weather it will vary as much as 11° C. (20° F.) in the course of the day. In severe weather the temperature of the house has been observed as low as 3° C. (36° F.), hence there is an annual range of nearly 30° C. (55° F.); nevertheless the mean summer temperature is about 24° C. (75° F.), and that of winter about 8° C. (47° F.). During the summer the plants are syringed three or four times a day, in winter two or three times a day according to the weather, or as the birch poles happen to be wet or dry. Strong and healthy stems flower annually, and occasionally twice a year, continuing in bloom several months.* The conditions under which *Renanthera coccinea* is so successfully cultivated at Chatsworth are peculiar and scarcely to be attained in less favoured places; the particulars here given may, however, serve as useful hints to cultivators of this orchid.

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* A plant was acquired in 1836 which flowered two years afterwards, when it was figured in Paxton's *Magazine of Botany*.

R. matutina.

Stems as thick as an ordinary writing pencil, 2—3 feet high under cultivation, leafy upwards. Leaves linear-oblong, 4—6 inches long, very leathery, channelled above, obliquely emarginate or two-lobed at the apex. Peduncles wiry, flexuose, branched, many flowered. Flowers bright reddish crimson toned with yellow, changing with age into orange-yellow, 2 inches in diameter, on slender pedicels that are coloured like the perianth; sepals and petals similar, linear, acute, the lateral sepals at first parallel then divergent; lip much smaller than the other segments, saccate, sub-cylindric, compressed with a small tongue-shaped reflexed lobule in front. Column very short.

Renanthera matutina, Lindl. Gen. et Sp. Orch. p. 218 (1832). Rchb. *Xen. Orch. I.* p. 90, t. 35 (1855). Miquel, Fl. ind. bat. III. p. 698. Linden's *Pesc.* t. 12. Aërides matutinum, Blume, Bijdr. p. 698 (1825).

Discovered in 1824 by Blume, growing on trees at the foot of Mount Salak, in Java, and where twenty years later it was re-discovered by Thomas Lobb, through whom it was introduced by our Exeter firm in 1846. For many years afterwards it was one of the rarest of cultivated orchids, but subsequent importations have caused it to become more generally distributed. Being less refractory to the cares of the cultivator than *Renanthera coccinea,* and being too of more manageable dimensions, it has proportionally gained in favour. The cultural treatment of *R. matutina* is the same as that of Aërides and Vanda.

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* For these particulars we are indebted to Mr. Owen Thomas, the excellent gardener to the Duke of Devonshire, at Chatsworth.

VANDA.

R. Br. in Bot. Reg. t. 506 (1820). Lindl. Gen. et Sp. Orch. p. 215 (1832). Benth. et Hook. Gen. Plant. III. p. 578 (1883).

The following synopsis includes all the species known to us to be in cultivation, and among them are assuredly some of the finest orchids ever introduced. Seven or eight other species are also known to science, but none of them can be said to possess any especial attraction for the horticulturist. Perhaps the most striking feature in Vanda, from a horticultural point of view, is the remarkable range of colour observable in the flowers of the different species, and even in varieties of the same species, surpassing in this respect every other genus of cultivated orchids. With the exception of the brilliant red seen in the allied genus, Renanthera, well nigh every variety of colour is represented throughout the Vandas; the tesselation of the floral segments of the type species and its immediate allies is also an attractive feature. Another property that renders the Vandas valuable as decorative plants is the persistency of their flowers, those of some of the species continuing fresh for upwards of three months.

The essential characters of the genus are seen chiefly in the form of the labellum and in its attachment to the column; these characters may be thus technically expressed:—

> The lip is affixed to the base of the column; it is saccate at its base or obtusely spurred; the lateral lobes are sometimes large, sometimes reduced to minute auricles, rarely 0; the middle lobe is variable in form, the disk of which is fleshy and usually ridged or lamellate.

Even when divested of those species which do not conform to these characters, and which have long been known in gardens as Vandas, but are now referred to other genera,* Vanda is still a polymorphous genus whose limits it is difficult to define, and which presents much that is perplexing to the systematist; thus aberrant forms are seen in *Vanda Sanderiana* which has a close affinity with the Arachnanthes, *V. parviflora* is better known as an Aërides, *V. densiflora* and *V. violacea* may with equal right be placed under Saccolabium, to which genus they are, in fact, referred in this work.

In their vegetation the Vandas resemble the Aërides except that there is much less uniformity of habit among them. Some of the species are slow growing, and never in a wild state attain the dimensions of their more robust congeners, *Vanda tricolor*, *V. cærulea*, etc., the most obvious part of whose life-history is essentially the same as an Aërides. *V. teres* is a scandent plant scrambling to the top of high trees, while *V. Hookeriana* of similar aspect is of much lower stature, and creeps over the low jungle growth, or affixes itself to the stems of a species of Pandanus (Screw-Pine).

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* *See* Stauropsis, Arachnanthe, and Saccolabium.

No satisfactory sectional divisions of Vanda have yet been established. Dr. Lindley distributed the species into five sections in his monograph of the genus in *Folia Orchidacea*, published in 1853, of which the first, FIELDIA, has by general consent been removed from it. The remaining four were adopted by Reichenbach a few years later when revising the genus for Walper's *Annales Botanices*, but they are separated by very artificial characters except perhaps two which Sir J. D. Hooker has retained in the *Flora of British India*, viz., EUVANDA and ANOTA, the last of which is chiefly distinguished from the true Vandas by the more densely flowered racemes, and by the absence of side lobes in the labellum. A sectional division into flat and round-leaved species as in Aërides (PLANIFOLIÆ and TERETIFOLIÆ) breaks down in *V. Amesiana* and *V. Kimballiana*, which are transitional species as regards the form of their leaves.

The name Vanda was communicated to Dr. Robert Brown, the founder of the genus, by the eminent oriental scholar and linguist, Sir William Jones. It is a Sanscrit word of rather wide import, for it seems to have been used for the common Vanda of Bengal and north-east India *(Vanda Roxburghii)*, and also for any orchid of similar habit, as *Aërides odoratum;* it was also applied to a parasitical plant, as the Loranthus or Mistletoe. The genus was selected by Lindley as the type of one of the fundamental (tribal) divisions of the order (VANDEÆ).

Geographical distribution. — The geographical distribution of the Vandas will be best understood by a reference to the map illustrating that of Phalænopsis and Aërides, to which we have also added Vanda. Certain peculiarities in the distribution of these genera are worthy of notice; thus, the Phalænopses are almost invariably insular or littoral; nearly all the most distinct types of Aërides are widely dispersed; but the species of Vanda, with the exception of *Vanda parviflora* and *V. Roxburghii*, are very local. It is a curious fact, too, that where Aërides is abundant a Vanda is to be found not far off; *V. Sanderiana* is associated with *Aërides Lawrenceæ* in south-east Mindanao; *V. lamellata* occurs with *Aërides Quinque-vulnera* near Manila; *V. cærulea* grows near *Aërides Fieldingii* on the Khasia Hills; *V. tricolor* is mixed with *Aërides virens* in Java; and other instances are indicated on the map.

Cultural Note.—The cultural routine for the majority of the Vandas is the same as that for Aërides. Special cultural notes are given under the description of those species that are exceptions to the general rule.

SYNOPSIS OF SPECIES AND VARIETIES.

Vanda alpina.

Stem but a few inches high and not thicker than a goose's quill. Leaves broadly linear, 2—3 inches long, unequally bi-lobed at the apex. Peduncles with one—two joints, at each of which is a scarious bract, one—two flowered. Flowers 1¼ inch across, vertically; sepals and petals light yellow-green, the dorsal sepal spathulate-oblong, the lateral two ovate-oblong, the petals linear-oblong, all more or less incurved; lip fleshy, saccate at the base, three-lobed, the side lobes triangular, erect, concave, and blackish purple on the inner side; the front lobe cordate at the base, gently reflexed, and with two horn-like cirri at the apex, striped longitudinally with blackish purple and light yellow. Column short, semi-terete, whitish.

Vanda alpina, Lindl. Fol. Orch. Vanda No. 25 (1853). Rchb. in Walp. Ann. VI. p. 870 (transcribed from Fol. Orch.). Hook. f. Fl. Brit. Ind. VI. p. 53. V. Griffithii, Lindl. in Paxt. Fl. Gard. sub. t. 41. Luisia alpina, Lindl. in Bot. Reg. 1838, misc. No. 101.

Discovered by Gibson in 1836 at Nungklow on the Khasia Hills, and introduced by him to Chatsworth in the following year. It was subsequently detected by Sir J. D. Hooker and Dr. Thomson on the same hills at 3,500—5,000 feet elevation, where, in the winter months, hoar-frost is formed on the ground and snow has been known to fall. It is very near *Vanda cristata*, of which it may be only an alpine form, and to which it is inferior in beauty. We are indebted to Mr. R. Irwin Lynch, Curator of the Botanic Garden, Cambridge, for materials for description.

V. Amesiana.

Stems but a few inches high. Roots numerous and very thick in proportion to the size of the plant. Leaves fleshy, semi-terete with a grooved face, 7—12 inches long, narrowed from the base to the acute tip. Peduncles ascending, longer than the leaves, dull green dotted with deep purple, racemose, rarely paniculate along the distal half.

Flowers fragrant, 1½ inch across, on somewhat slender, slightly twisted angulate pedicels (including ovary) 1½ inch long; sepals and petals subsimilar and sub-equal, oval-oblong obtuse, white with a delicate flush of light rose-purple; lip three-lobed, the small basal lobes sub-quadrate with rounded distal end, white slightly tinted with rose; the intermediate lobe broadly clawed, the blade transversely oblong, emarginate, reflexed at the sides, and traversed by three thickened longitudinal central lines, amethyst-purple, much paler, sometimes white at the margin; spur saccate, compressed. Column white stained with purple.

Vanda Amesiana, Rchb. in Gard. Chron. I. s. 3 (1887) p. 764; II. p. 586.; V. (1889) p. 233. Williams' *Orch. Alb. VII.* t. 296. *Bot. Mag.* t. 7139.

A very pretty recent addition to the genus introduced by Messrs. Low and Co., in the first instance accidentally (it is said) among other things, but subsequently followed by a large importation. The habitat of the species is now known to be on the hills in the southern Shan States at 4,000—5,000 feet elevation, growing mostly on rocks fully exposed to the sun, but sometimes on trees in partial shade.* It flowers in December and January; the temperature at that season ranging from about 2°—18° C. (36°—65°) in the course of twenty-four hours, the ground being sometimes quite white with hoar-frost in the early morning (4—6 a.m.). In the dry season the plants are much shrivelled, as the deposit of dew on these hills is much lighter than in the equatorial zone. It is dedicated to the Hon. F. L. Ames, of North Easton, Massachusetts, a well-known patron of horticulture and an ardent amateur of orchids. *Vanda Amesiana* is remarkable for the unusual thickness and number of the aerial roots produced from the base and lower part of the stem, apparently at the expense of that organ, which, so far as cultural experience has yet reached, attains but very limited dimensions. The rose-purple colouring of the flowers is very variable, no two plants producing flowers exactly alike in this respect, being deeper in some, lighter in others, and even nearly disappearing in the horticultural variety called *alba*.

V. Bensonii.

Leaves 7—10 inches long, and ½—¾ inch broad, obliquely truncate, and toothed at the apex. Racemes ascending, longer than the leaves, 10—15 or more flowered. Flowers 2 inches in diameter, on white

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*** This information reached us too late to admit of the habitat of this species and the allied *Vanda Kimballiana* which is associated with it, being indicated on the map illustrating the geographical distribution of the genus.**

twisted angulate pedicels; sepals and petals similar and sub-equal, shortly clawed with a broadly ovate obtuse blade, yellow or yellowish green veined and reticulated with chestnut-brown, pale rose or whitish behind; lip broadly clawed, the claw yellowish above and with a triangular white auricle on each side; the blade fleshy, convex with three raised median lines, cordate-oblong, expanding at the apex into two oblong-falcate lobes, light rose-purple; spur short, funnel-shaped, compressed. Column light rose-purple.

Vanda Bensonii, Batem. in *Bot. Mag.* t. 5611 (1866). Rchb. in Gard. Chron. 1867, p. 180, icon. xyl. Id. Xen. Orch. II. p. 138. Van Houtte's *Fl. des Serres, XXII.* t. 2329. Hook. f. Fl. Brit. Ind. VI. p. 51.

Introduced by us in 1866 through General Benson, who had discovered it in Lower Burmah, between Prome and Tongu, associated with *Saccolabium giganteum* and *Rhynchostylis retusa.* It occurs on trees in a deciduous jungle fully exposed to the sun in the dry season, when the temperature frequently rises to 45° C. (112° F.) in the shade and when its leaves are often scorched.*

V. cærulea.

Leaves leathery, 5—8 inches long, ¾—1 inch broad. Racemes erect or sub-erect, longer than the leaves, 8—15 or more flowered. Flowers 3—4 inches in diameter, on light blue pedicels 2 inches long, ribbed and twisted; sepals and petals clawed, the claw of the petals slightly twisted, broadly obovate, the two lateral sepals longer and broader than the upper three segments, all of a soft light blue faintly tesselated with azure-blue; lip much shorter than the petals, linear-oblong, three-lobed, the side lobes with a short, incurved cusp at the apex; the front lobe nearly parallel with the column, deep blue, obtuse at the apex, where there are two small tubercles each with 2—3 thickened ridges above; spur short, conical, with a bipartite callus at its mouth. Column white above with a violet stain below the stigma.

Vanda cærulea, Griffith MS. ex. Lindl. in Bot. Reg. 1847, sub. t. 30. Lindl. in Paxt. *Fl. Gard. I.* t. 36. Id. Fol. Orch. Vanda No. 18. Id. in Journ. Hort. Soc. Lond. vol. VI. p. 8 (1851), icon. xyl. (*lapsus calami* cærulescens). Rchb. *Xen. Orch. I.* p. 8, t. 5 (1854). Van Houtte's *Fl. des Serres VI.* t. 609 (copied from Paxt. Fl. Gard.) Linden's *Pesc.* t. 29. *Illus. hort.* 1860, t. 246. Warner's *Sel. Orch. I.* t. 18. Jennings' *Orch.* t. 34. De Puydt, *Les Orch.* t. 45. Williams' *Orch. Alb. VI.* t. 282. Sander's *Reichenbachia II.* t. 57. Godefroy's *Orchidophile,* 1890, p. 369. Hook. f. Fl. Brit. Ind. VI. p. 51.

This lovely Vanda was first discovered by the excellent Indian botanist and explorer, William Griffith, in November, 1837, on the Khasia Hills, growing on large Gordonia trees amidst oaks and pines, in a locality which he describes as "really delightful, reminding one much of England."† The first published notice of it appeared in the *Botanical Register* for 1847, sub. t. 30, where it is described by Dr. Lindley from a dried specimen sent to him by Griffith. Three years later it was re-discovered by Sir J. D. Hooker and Dr. Thomson on the Khasia Hills, and from the *Himalayan Journals*[*] of the first-named distinguished botanist we extract the following lucid description of its native habitat:—

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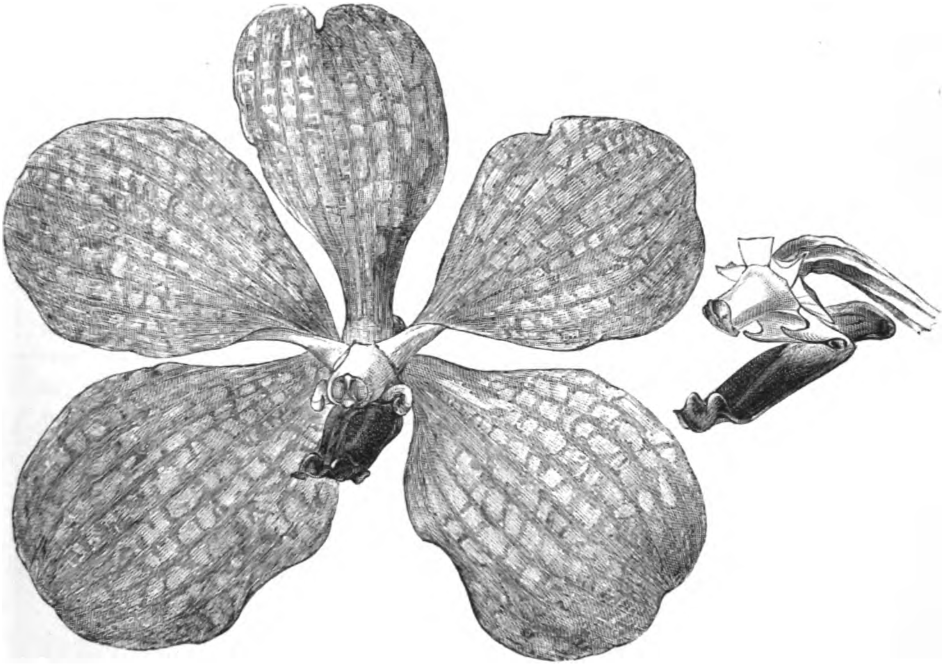
* Gard. Chron. 1870, p. 311.

† Private Journals and Itinerary Notes, p. 181.

> "In the oak woods near the village of Lermai, *Vanda cærulea* grows in profusion. The high grassy hills which it inhabits are elevated from 3,000 to 4,000 feet; the trees on which it grows are small, gnarled and very sparingly leafy, so that the Vanda is fully exposed to sun, rain and wind. There is no moss or lichen on the branches with the Vanda, whose roots sprawl over the dry rough bark. The atmosphere is, on the whole, humid, and extremely so during the rains, but there is no damp heat or stagnation in the air, and at the flowering season the temperature ranges between 15° and 26° C. (60°—80° F.); there is much sunshine, and both air and bark are dry during the day. In July and August, during the rains, the temperature is a little higher, but in winter it falls much lower."



Vanda cærulea.

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[*] Vol. II. p. 322.

Before, however, these classic journals were published, our energetic collector, Thomas Lobb, had made his way to the Khasia Hills and despatched a consignment of plants to our Exeter firm, which fortunately arrived in good condition. One of the first plants to flower was exhibited by us at the meeting of the Horticultural Society of London, held in Regent Street on December 3rd, 1850, when it was received with marked favour. As a proof of the high estimation in which this orchid has been and is still held by amateurs, we need only point to the unusual number of coloured illustrations of it published in the horticultural periodicals quoted above.

Cultural Note.—Not much can be added to the above description of the conditions under which *Vanda cærulea* grows in its native home. Mr. C. B. Clarke, the excellent Indian botanist, communicates to the *Gardeners' Chronicle* (*I.* s. 3 (1887), p. 77) the following:—"In Shillong station on the Khasia hills, at 5,000 feet altitude, it is not unusual for 8 to 10 degrees (Fahr.) of frost to occur in the month of January. At this level, and even higher, *Vanda cærulea* grows very fast and flowers profusely. It comes into flower in October at the end of the rains and remains long in flower." These climatic data therefore afford but a slender clue to the cultural treatment of the plant, as any approach to imitating the extensive range of temperature to which it is subjected on its native hills, and the excessive downpour of rain upon it during the growing season is simply impracticable in the glass-houses of this country. The practice of the most experienced cultivators is to give *V. cærulea* the lightest position in the East Indian house during the period of active growth, usually suspending it in a teak basket near the roof-glass, and supplying it with abundance of moisture. As soon as the flowers are ready to expand it is then removed to a cooler and drier house in which the range of temperature does not exceed 10°—15° C. (50°—60° F.).

V. cærulescens.

Leaves 5—8 inches long, ¾ inch broad, channelled above and strongly keeled beneath, two-lobed at the apex, the lobes terminating in spiny tips. Racemes nearly as long again as the leaves, many flowered. Flowers 1—1¼ inch in diameter, on twisted pedicels (including ovary) 1½—2 inches long; sepals and petals obovate-spathulate, pale blue; lip deep blue, three-lobed, the side lobes small, oblong, the intermediate lobe obovate, emarginate with deflexed margin and two thickened median ridges above; spur short, incurved. Column blue; anther yellowish.

Vanda cærulescens, Griffith, Notulæ, p. 352 (1851). Lindl. Fol. Orch. Vanda, No. 19 (1853). Rchb. in Gard. Chron. 1869, p. 491, and 1870, p. 527, icon. xyl. *Bot. Mag.* t. 5834. Williams' *Orch. Alb. I.* t. 48. *Fl. Mag.* n. s. t. 256. Hook. f. Fl. Brit. Ind. VI. p. 50.

sub-vars.*— *Boxall's* (Gard. Chron. VII. (1877), p. 749. *Bot. Mag.* t. 6328), sepals and petals paler than in the type, disk of the lip with dark blue stripes alternating with light ones, and passing into violet-blue at the apical edge; *Captain Vipan's* (Gard. Chron. XXV., p. 752) (1886), sepals and petals white, lip stained and spotted with light purple; *Low's* (Gard. Chron. VIII. (1877), p. 102), sepals and petals light mauve suffused with white; lip and column amethyst-purple toned with carmine.

To the energetic Indian explorer, William Griffith, science is also indebted for the first discovery of this blue Vanda, which, if not so striking in aspect as the preceding species, is scarcely less worthy of cultivation. Griffith detected it at Psembo, near Bhamo, in Upper Burmah, in April, 1837; he made an imperfect sketch of it *in situ* and preserved a dried specimen, both of which were sent to Kew. Nothing more was seen of it for thirty years until Colonel (now General) Benson re-discovered it on the Arracan Mountains west of Prome, growing on deciduous trees at 1,000—1,500 feet elevation. A dried specimen and coloured drawing were communicated by him to Kew in 1867, and in the following year it was introduced by us through him. It flowered for the first time in this country in our Chelsea nursery in February, 1869. The sub-varieties named after Low and Boxall were introduced in 1877 by Messrs. Low and Co. through their collector, Boxall, and Captain Vipan's by the gallant officer whose name it bears in 1885—6. The usual flowering season of *Vanda cærulescens* is June and July.

V. concolor.

Leaves 7—9 inches long and about an inch broad, obliquely bilobate, sometimes tridentate at the apex. Racemes ascending, as long as the leaves, 7—10 flowered. Flowers somewhat distant, 2 inches in diameter, on rather long, greenish, twisted and ribbed pedicels; sepals and petals yellow-brown, white behind, obovate-oblong, obtuse, undulate; lip three-lobed, the basal lobes oblong, erect, white streaked with red on the inner side, the front lobe oblong, retuse, constricted at the middle, with five raised lines on the yellow basal half, the apical half yellow-brown; spur short, conic. Column white.

Vanda concolor, Blume, Rumphia IV. p. 49, sub. V. furva (1848). Lindl. Fol. Orch. Vanda, No. 5 (1853). Godefroy's *Orchidophile*, 1887, p. 144. V. Roxburghii unicolor, Hook. *Bot. Mag.* t. 3416. V. furva, Lindl. in Bot. Reg. 1844, misc. No. 42 (not Blume).

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* Horticultural forms of the type species presenting no tangible botanical differences entitling them to rank as varieties (Bot. Mag. sub. t. 6328).

Introduced by Messrs. Loddiges prior to 1835, in which year it flowered in the garden of Earl Fitzwilliam, at Wentworth Woodhouse, near Sheffield. It is now but rarely seen in orchid collections, the homely colour of its flowers offering but little attraction to amateurs. Its habitat is vaguely stated to be China.

V. cristata.

Leaves 5—7 inches long, ½—¾ inch broad, irregularly three-toothed at the apex Racemes usually shorter than the leaves, 5 — 6 flowered. Flowers 2 inches in diameter on twisted six-ribbed pedicels; sepals and petals incurved, of a uniform light yellow-green, the former spathulate-oblong, the latter narrower, linear-oblong; lip broadly oblong, with two incurved triangular basal lobes above the short conical spur; the blade traversed longitudinally by 5 — 7 thickish raised white lines between which are deep red-purple stripes, and terminating in front in two lateral horn-like processes, and a similar smaller one beneath at the sinus between the other two. Column white.

Vanda cristata, Lindl. Gen. et Sp. Orch. p. 216 (1832). Id. Sert. Orch. fig. 3, in frontisp. Id. Fol. Orch. Vanda, No. 23. *Bot. Reg.* 1842, t. 48. *Bot. Mag.* t. 4304. Regel's *Gartenfl.* 1870, t. 680. Williams' *Orch. Alb. VII.* t. 290. Hook. f. Fl. Brit. Ind. VI. p. 53. V. striata, Rchb. Xen. Orch. II. p. 137.

A very distinct Vanda, inhabiting the lower or tropical Himalayan zone from Kumaon eastwards into Bhotan. It was gathered by the earlier Indian botanists in various localities along that rich orchid belt, first in 1818, in Nepal, by Dr. Wallich, who subsequently sent it to the Royal Gardens at Kew, where probably it flowered for the first time in Europe, but no date is recorded. It was next found by Griffith in Bhotan, subsequently by Cathcart in Sikkim, and later by Falconer near Darjeeling. Messrs. Rollisson, of Tooting, in whose nursery it flowered in 1842, were probably the first to distribute it among the orchid collections of Great Britain.

V. Denisoniana.

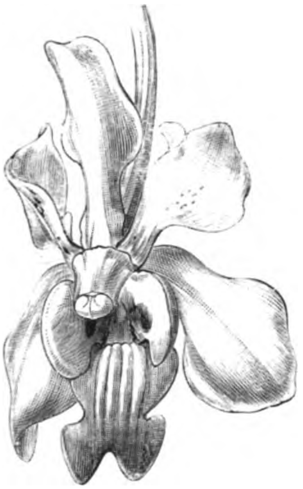
Leaves pale green, 7—12 or more inches long, and about ¾ inch wide. Racemes shorter than the leaves, few flowered. Flowers 2½ inches across vertically; sepals and petals more or less reflexed, much undulated, ivory-white, the upper sepal and petals oblong-spathulate, the lateral sepals broader, obliquely obovate; lip three-lobed, the side lobes erect, rotund, concave on the inner side, and of a purer white than the other parts of the lip; the intermediate lobe oblong, contracted at the middle and with an angular sinus in the anterior margin, convex above, with four—five longitudinal thickened raised lines, greenish white; spur conical; callus two-lobed, on each side of which is a semi-lunate orange-yellow blotch.

Vanda Denisoniana, Benson and Rchb. in Gard. Chron. 1869, p. 528. *Bot. Mag.* t. 5811. *Illus. hort.* 1872, t. 105. Hook. f. Fl. Brit. Ind. VI. p. 51.

var.—hebraica.[*]

"Sepals and petals sulphur-yellow marked with numerous spots, transverse short bars and figures comparable with the Greek letter Λ; lip sulphur-yellow, the lateral lobes paler; spur orange inside."

V. Denisoniana hebraica, Rchb. in Gard. Chron. XXIV. (1885), p. 39. Williams' *Orch. Alb. VI.* t. 248.



Vanda Denisoniana.

Discovered by Colonel (now General) Benson growing in sheltered and shaded spots on large trees on the Arracan Mountains westward from Prome, at an altitude of 2,000—2,500 feet, where the mean temperature is about 21° C. (70° F.), and the average yearly rainfall is from 90—100 inches.[†] It was introduced by us through Colonel Benson in 1868, and it flowered for the first time in this country in our Chelsea nursery in April of the following year, when it was dedicated by the late Professor Reichenbach to Lady Londesborough. The variety, which is a horticultural form of great merit, differing in nothing from the type except in colour, appeared some years ago amongst an importation by the late Mr. B. S. Williams, of Holloway.

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[*] Not seen by us.

[†] Colonel Benson in Gard. Chron. 1870, p. 796, who gives the following further particulars of the climate of that part of Lower Burmah:—"These mountains (Arracan) form as it were a barrier to the south-west monsoon, arresting its force to the eastward, consequently the country around Prome and Thayetmyo has a considerably drier climate than that about Rangoon and Moulmein. Thus the rainfall on the Prome or east side is very much less than on the west side, which is exposed to the full volume of the south-west monsoon coming direct from the ocean. Although the rainfall on the east side is greatly diminished in intensity, yet rain clouds hang about the tops of these hills, giving them a watery vapour, an atmosphere in which these plants (orchids) delight, but without a great deluge of rain."

V. Hookeriana.

Stems cylindric, somewhat slender, 5—7 or more feet long in the wild state, much shorter under cultivation. Leaves like the stems, but more slender, 2—3 inches long, channelled on the face, and mucronate at the apex. Peduncles from the upper part of the stem, 2—5 or more flowered. Flowers 2½ inches in diameter, on white, slightly twisted, obscurely grooved pedicels 1½ inch long; sepals obovate-oblong, the upper one bent forward and much undulated, white faintly flushed with light purple, the lateral two narrower and keeled behind, wholly white; petals broadly oval, undulated, white flushed with light purple and dotted with deeper purple, chiefly on the inferior half; lip three-lobed, the side lobes triangular-falcate, amethyst-purple with paler striations; front lobe broadly fan-shaped, itself three-lobed, the lobes rounded with crenulate margin, white much spotted and marked with amethyst-purple, the spots and markings aggregated towards the short claw below which is a two-lobed, white, fleshy crest; spur short, acute. Column terete, bent, purple above, paler beneath; anther shortly beaked.

Vanda Hookeriana, Rchb. in Bonpl. IV. p. 324 (1856). Id. in Gard. Chron. XVIII. (1882), p. 488. *The Garden, XXIII.* (1883), t. 370. Williams' *Orch. Alb. II.* t. 73. *Illus. hort.* 1883, t. 484. Sander's *Reichenbachia, II.* t. 74. Hook. f. Fl. Brit. Ind. VI. p. 50.

This lovely Vanda was communicated to Sir W. J. Hooker, at Kew, by Motley, some time prior to 1856, in which year the herbarium specimen was examined by the late Professor Reichenbach, and the species described by him in Seeman's *Bonplandia.* There can be but little doubt, however, that the plant had been previously met with by Thomas Lobb and Sir Hugh Low, for Mr. Burbidge, who has also seen it *in situ*, states that it is common in north Borneo along rivers and in brackish swamps near the sea. It is particularly abundant along the Tandaram and Limbang Rivers, about twenty miles from Brunei, and there Lobb, Low and others obtained it,* but failed to introduce it alive. It was not till 1879 that a very few living plants at length reached this country, and these were received by us from a correspondent at Labuan, and were immediately afterwards

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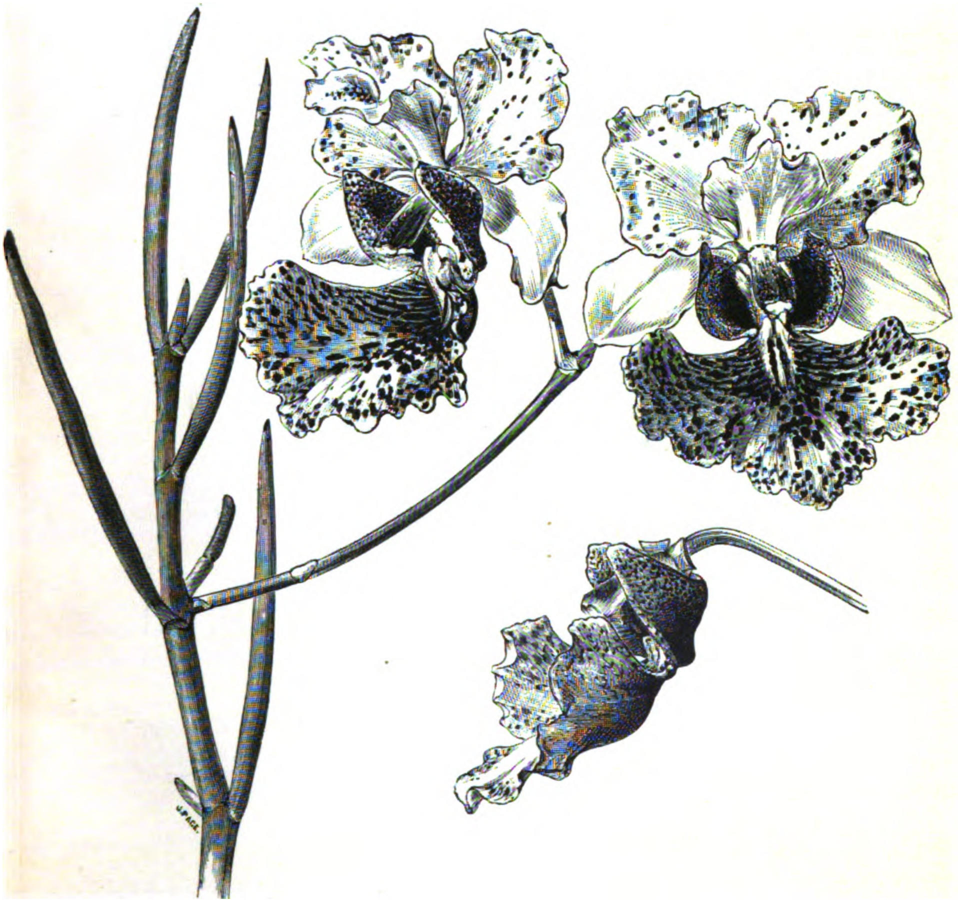
* The Garden, XXII. (1883), p. 10. Id. XXXVIII. (1890), p. 72.



Vanda Hookeriana.

acquired by Lord Rothschild. None of them could be induced to flower till September, 1882, but since that date the flowering of *Vanda Hookeriana* has been an annual occurrence at Tring.

In Borneo, *Vanda Hookeriana* is epiphytal, often growing on a slender-stemmed species of Pandanus above the water or mud fully exposed to the blazing sun. It has since been discovered in the district of Kinta, in Perak, in a long valley formed by ranges of limestone hills, and watered by the Perak River, by Major Frowd Walker, who has communicated the following particulars of its habitat to *The Garden*,† through Mr. B. D. Knox, of Caversham, Reading:—

> "The district is thickly studded with marsh; these marshes are full of thick low jungle not more than 5 feet high, quite or almost destitute of forest, and therefore exposed to the full rays of the sun. In some of these marshes *Vanda Hookeriana* is found creeping over the jungle growth; the stems rest on the top of the bushes, and the aerial roots cling to them. The flowers are always seen on the top of the bushes in the blazing sun, and are produced all the year round. So common is this flower in the district that it is called the 'Kinta weed.' The observed temperature in Kinta during the year 1889 ranged from 18°—36° C. (64°—97° F.), and the rainfall exceeded 150 inches."

Cultural Note.—At Tring Park *Vanda Hookeriana* is cultivated in a house almost entirely devoted to the allied *V. teres*, and which we have described in the cultural note relating to that species. For *V. Hookeriana* pots 6 inches in diameter at the rim are preferred; the pots are filled with a mixture of broken crocks and charcoal, and surfaced with sphagnum moss that is kept constantly saturated. The plants, about four in number to each pot, are affixed by means of copper wire to a piece of board 15—18 inches long, 6 inches broad at top, and about ½ inch thick; the boards with the plants so affixed to them are plunged to the bottom of the pots, so that the lower part of the stems is buried in the mixture of crocks and charcoal. The treatment as regards temperature, watering, etc., is the same as for *V. teres*, and is given in detail under that species.

V. insignis.

Leaves 9—12 inches long, and about an inch broad, obliquely incised and toothed at the apex, strongly keeled beneath. Racemes scarcely longer than the leaves, 4—7 flowered. Flowers 2—2½ inches in diameter, on white, twisted, grooved pedicels; sepals and petals obovate-spathulate, bright tawny yellow with dark brown oblong spots that are confluent at the margins and apex; lip sub-pandurate, with two short white basal auricles and two low white ridges between them; blade broadly clawed, semilunar, concave with entire edge, bright rose purple; spur conic, compressed, recurved. Column very thick, stained with pale rose.

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† XXXVIII. (1890), p. 210.

Vanda insignis, Blume, *Rumphia, IV.* p. 48, t. 192, f. 2 (1848). Lindl. in Paxt. Fl. Gard. II. p. 19, icon. xyl. Rchb. in Gard. Chron. 1868, p. 1259. *Bot. Mag.* t. 5759. Jennings' *Orch.* t. 46. Williams' *Orch. Alb. IV.* t. 172.

var.—Schroederiana.

Sepals and petals light yellow shaded with orange; lip cream-white with two orange lines in front of the spur.

V. insignis Schroederiana, Rchb. in Gard Chron. XX. (1883), p. 392. *The Garden, XXV.* (1884), t. 429.

First discovered by Blume in the island of Timor some time prior to 1848, the date of the publication of *Rumphia* in which it is figured and described. It was re-discovered by our collector, Hutton, in 1866, and introduced by us through him in the following year; it flowered for the first time in this country in our Chelsea Nursery in the autumn of 1868. It continued to be very rare in British collections till re-imported by us in 1882 through Curtis, at that time collecting for us in the Malay Archipelago. It occurs along the coast of Timor and the adjacent small island of Semao, and on low hills up to 1,000 feet elevation, growing on low trees where it gets but slight shade, and flowering in March and April. The variety *Schroederiana* was received with Curtis' consignment, a single plant only; it is a most remarkable colour deviation from the type, and one of the handsomest of Vandas; it is now in the collection of Baron Schroeder, at The Dell.

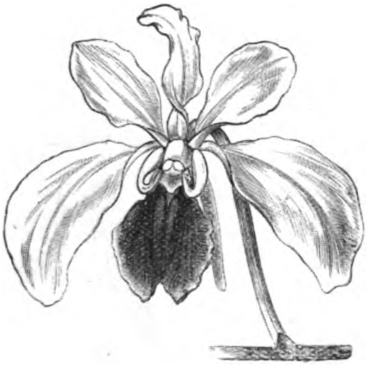
The *Vanda insignis* described above should not be confounded with another Vanda sometimes met with in cultivation under the same name, which is but a colour variation of *V. tricolor.*

V. Kimballiana.

Leaves sub-cylindric, acuminate, 6—9 inches long, channelled down the face, deep green with a purplish bronzy hue. Peduncles slender, scarcely longer than the leaves, with a small papery sheath at each of the joints, and a small, brown, acute bract at the base of the stalked ovaries, 8—12 flowered; pedicels (with ovary) 1¼ inch long, obscurely grooved, very pale purple. Flowers 1½— 2 inches in diameter; upper sepal and petals shortly clawed, obovate-spathulate, white sometimes faintly flushed with pale purple, and with light purple nerves; lateral sepals longer than the upper one, oblong, falcate, white; lip three-lobed, the side lobes ovate-triangular terminating in an incurved, horn-like cirrus, yellowish spotted with red-brown on the inside; the middle lobe broadly ovate, undulate, crisped and erose at the margin, with three paralled keels in the middle, amethyst-purple; spur incurved, nearly an inch long, pale purple. Column white.

Vanda Kimballiana, Rchb. in Gard. Chron. V. s. 3 (1889), p. 232. *The Garden*, *XXXVII.* (1890), t. 747. *Bot. Mag.* t. 7112.

Introduced by Messrs. Low and Co. about the same time as *Vanda Amesiana,* to which it is nearly allied; its terete leaves would also indicate an affinity with *V. teres* and *V. Hookeriana,* but the floral characters differ widely from both. Its habitat is on the hills in the southern Shan States at 4,000—5,000 feet elevation, where it is associated with the allied *V. Amesiana* growing under the conditions we have described in page 89. It is dedicated to Mr. W. S. Kimball, of Rochester, New York, one of the most zealous orchidists in the United States.



Vanda Kimballiana.

V. lamellata.

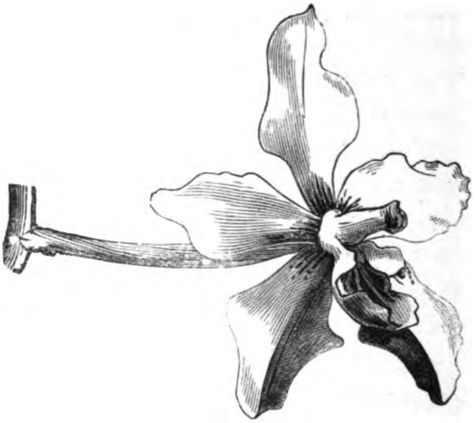
Leaves 12—15 inches long, $\frac{1}{2}$—$\frac{3}{4}$ inch broad, obliquely bi-dentate at the apex and strongly keeled beneath. Racemes erect or sub-erect, as long as the leaves, many flowered. Flowers 1—2 inches in diameter, light yellow blotched with chestnut-brown; sepals and petals oblong, obtuse, the lateral sepals the broadest and sub-falcate; lip prolonged at the base into a short obtuse spur, three-lobed, the basal lobes auriculate, rotund, erect, white; the intermediate lobe oblong-retuse at the apex and traversed longitudinally by two raised plates that are broadest at the middle.

Vanda lamellata, Lindl. in Bot. Reg. 1838, misc. No. 125. Id. Fol. Orch. Vanda, No. 20.

var.—Boxalli.

Leaves somewhat longer and narrower than in the type. Racemes longer and bearing more flowers. Flowers more brightly coloured; sepals and petals cream-white,* the superior half of the broader lateral sepals also cream-white, the inferior half red-brown, the basal auricles of the lip white spotted with light purple, the blade rose-purple.

V. lamellata Boxalli, Rchb. in Gard. Chron. XIII. (1880), p. 743. Id. XV. (1881), p. 87, icon. xyl. *The Garden, XIX.* (1881), t. 287. Williams' *Orch. Alb. VIII.* t. 338.



Vanda lamellata Boxalli.

(From the *Gardeners' Chronicle.*)

The typical *Vanda lamellata* was first sent to Messrs. Loddiges from the Philippine Islands by Cuming in 1838, but it is now very rarely seen in the orchid collections of this country. The variety, which has flowers of brighter and more showy colours, was introduced by Messrs. Low and Co. in 1879, through the collector whose name it bears. Both the type and its variety grow on trees in the hot damp valleys in the neighbourhood of Manila.

V. limbata.

"Leaves 6—8 inches long and ¾—1½ inch broad. Racemes as long as the leaves, 10—12 flowered. Flowers 2 inches in diameter; sepals and petals nearly equal and similar, spathulate, bright cinnamon colour within and tesselated, with a golden border, pale and suffused with lilac externally; lip three-lobed, pale lilac, produced behind into a short, conic, obtuse spur; lateral lobes small, rounded; mid lobe quadrate,

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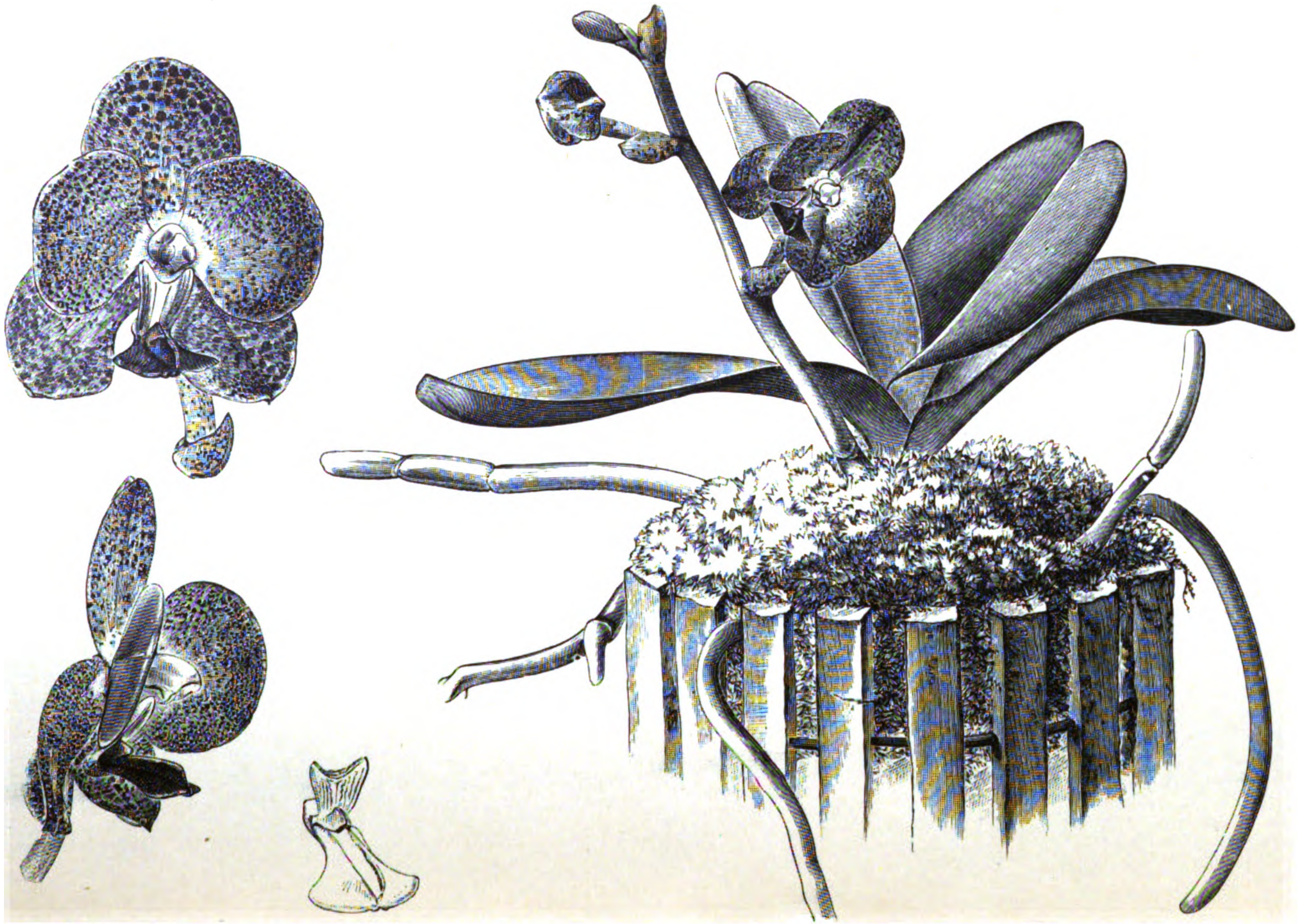
* Light yellow in the plate in Williams' *Orchid Album*, loc. cit.



Vanda Parishii, var. Marriottiana.

slightly fiddle shaped, obscurely mucronate at the truncate tip; disk tumid with 5—7 parallel grooves, margins reflexed; claw with a prominent callus."—*Botanical Magazine.*

Vanda limbata, Blume, Rumphia, IV. p. 49, sub. V. furva (1848). Lindl. Fol. Orch. Vanda No. 13. *Bot. Mag.* t. 6173. Warner's *Sel. Orch. III.* t. 9.

A native of Java, where it was detected by Dr. Blume prior to 1848, the date of the publication of *Rumphia.* It was introduced to British gardens by the late Mr. B. S. Williams, of Holloway, not, however, from Java, but from Paris where he had acquired the plants figured in the *Botanical Magazine* and Warner's *Select Orchidaceous Plants* some time previous to their flowering in the summer of 1874. It is so seldom seen in cultivation that it may be assumed to be a rare species in its native island.

V. Parishii.

Leaves elliptic-oblong, 6—9 inches long, 2¼—3 inches broad, sessile or sheathing at the base, unequally bi-lobed or emarginate at the apex. Peduncles stoutish, sub-erect, longer than the leaves, racemose along the distal half, 7—10 or more flowered. Flowers fleshy, 2 inches in diameter; pedicels stoutish, slightly twisted, with a broad subulate bract at their base; sepals broadly oval-oblong, keeled behind, greenish yellow spotted with red-brown; petals sub-orbicular, broader than the sepals but coloured like them; lip with two rounded auricles at the base, and produced behind into a short gibbous spur; blade sub-rhomboidal with a raised median line and a conic protuberance at its base, magenta-purple with pale margin. Column very short and thick, white.

Vanda Parishii, Rchb. Xen. Orch. II. p. 138 (1867). Id. in Gard. Chron. 1870, p. 890. Williams' *Orch. Alb. I.* t. 15. Hook. f. Fl. Brit. Ind. VI. p. 51.

var.—Marriottiana.

As compared with the type the racemes are fewer flowered, the flowers somewhat smaller but more symmetrical in outline, and with proportionately broader sepals and petals that are bronzy red toned with brown, passing into rose-purple towards the base, white at the very base; the basal auricles of the lip white streaked with rose-purple, the blade magenta-purple.

V. Parishii Marriottiana, Rchb. in Gard. Chron. XIII. (1880), p. 748. Id. XV. (1881), p. 726. Williams' *Orch. Alb. II.* t. 61. N. E. Brown in Gard. Chron. XIX. (1883), p. 307 (purpurea).

The typical *Vanda Parishii* was discovered in Moulmein in 1862 by the Rev. C. S. Parish and shortly afterwards lost; it was re-discovered in 1870 and imported by Messrs. Low and Co., but it is still comparatively rare in British collections. The variety, which is greatly preferred by amateurs, although structurally identical, is a very remarkable deviation from the type as regards colour. It flowered for the first time in this country in the collection of Sir W. H. Marriott, Bart., at the Down House, Blandford, to whom it is appropriately dedicated.

V. parviflora.

"Leaves lorate, unequally notched at the apex, and having a mucro at the sinus beneath. Racemes longer than the leaves, many flowered; sepals and petals testaceous, spreading, sub-uniform, obovate-spathulate; lip three-lobed, the side lobes small, incurved, the middle lobe large, broadly oblong, dilated and crenate at the apex, white above with elevated lamellæ on the thick fleshy disk that is stained and spotted with purple; spur moderately long, obtuse, incurved."—*Botanical Magazine.*

Vanda parviflora, Lindl. in Bot. Reg. 1844, misc. No. 57. Wight, Icon. t. 1669. Hook. f. Fl. Brit. Ind. VI. p. 50. V. testacea, Rchb. in Gard. Chron. VIII. (1877), p. 166. Aërides Wightianum, Lindl. Gen. et Sp. Orch. p. 238 (1832). Id. in Journ. Linn. Soc. III. p. 40. *Bot. Mag.* t. 5138. A. testaceum, Lindl. Gen. et Sp. Orch. p. 238.

This is the commonest and most widely dispersed of all the Indian Vandas, and in this respect it presents a remarkable exception to the restricted habitats of most of the other species. It occurs in the tropical Himalaya from Kumaon eastwards into Assam; in Burmah generally and other parts of the eastern peninsula; on the western Ghauts from Bombay southwards to Travancore; also in Ceylon. It appears to have been first introduced into British gardens in 1844 by Messrs. Loddiges; and it has been since frequently imported with other Indian orchids; it is best known in cultivation under the name of *Aërides Wightianum.*

V. Roxburghii.

Stems 12—20 inches high under cultivation. Leaves linear, curved, very leathery, 5—7 inches long, and ½—¾ inch broad, tridentate at the apex. Racemes ascending, longer than the leaves, 5—9 or more flowered. Flowers 2 inches in diameter, on white, grooved, slightly twisted pedicels; sepals and petals oval-oblong, undulated, pale green tesselated with brown on the inner side, white behind; lip three-lobed, produced behind into a conic, obtuse spur, the side lobes small, lanceolate, acute, white; the intermediate lobe first roundish then quadrate with a notch in the anterior margin, convex above, violet-purple, paler towards the base. Column white.

Vanda Roxburghii, R. Br. in *Bot. Reg.* t. 506 (1820). *Bot. Mag.* t. 2245 (1821). Lindl. Gen. et Sp. Orch. p. 215 (1832). Van Houtte's *Fl. des Serres, II.* t. 11. Wight's Icon. III. t. 916. Williams' *Orch. Alb. II.* t. 59. Hook. f. Fl. Brit. Ind. VI. p. 52. V. tessellata, Paxt. *Mag. Bot. VII.* p. 265 (1840). V. tesselloides, Rchb. in Walp. Ann. VI. p. 864 (1864). Cymbidium tesselloides, Roxb. Fl. ind. III. p. 463 (1832).

The species upon which the genus was founded and the first Vanda that was introduced into British gardens. It was cultivated by Sir Joseph Banks in the early part of the present century, and flowered for the first time in his stove at Springrove in the autumn of 1819. It is common in various parts of Bengal, growing upon different kinds of trees but principally on the Mango (*Mangifera indica*); it also occurs on the Concan Hills in the Bombay Presidency and in Ceylon.

It was named in compliment to Dr. William Roxburgh, one of the earliest pioneers of Indian botany and Director of the Botanic Garden at Calcutta from 1797 to 1814.

V. Sanderiana.

Leaves 12—15 inches long and about an inch broad, complicate at base, truncate, cuspidate, sometimes unequally two-lobed at apex. Racemes sub-erect, generally shorter than the leaves, 7—10 flowered. Flowers flat, 3½ — 4½ inches in diameter, the pedicels and ovary six-ribbed, twisted, pale brown at the base, passing into light purple upwards; bracts oblong, acute, pale yellow-green; sepals broadly obovate, the dorsal one delicate rose colour suffused with white; the lateral two divergent, somewhat larger than the dorsal one, tawny yellow with sanguineous red anastomosing prominent veins; petals rhomboid-ovate, smaller than the sepals, coloured like the dorsal sepal with a tawny blotch spotted with red on the side next the lateral sepals; lip small in proportion to the other segments, bipartite, the hypochile transversely oblong, concave, with an inflexed anterior margin, variable in colour, usually dull tawny yellow streaked with red on the inner side; the epichile shortly clawed, roundish oblong, strongly recurved at the apex, with three prominent ridges on the disk, reddish brown. Column very short, buff-yellow.

Vanda Sanderiana, Rchb. in Gard. Chron. XVII. (1882), p. 588; XX. (1883), p. 440, icon. xyl. Williams' *Orch. Alb. III.* t. 124. *Illus. hort. XXXI.* t. 532. *Rev. hort.* 1885, p. 372. Sander's *Reichenbachia II.* t. 62. *Bot. Mag.* t. 6983. Esmeralda Sanderiana, Rchb. in Gard. Chron. XVII. (1882), p. 588 (sub. V. Sanderiana).

This remarkable Vanda, one of the most appreciable gains to horticulture during the last decade, was discovered by M. Roebelin, the energetic collector of Messrs. Sander and Co., who succeeded, in 1882, in reaching the previously unexplored portion of south-east Mindanao, where he detected this and the scarcely less remarkable *Aërides Lawrenceæ* and *Phalænopsis Sanderiana.* Our own collector, David Burke, also succeeded in reaching the same region a few months later, and from that time these fine orchids became generally distributed among the orchid collections of Europe and America. The principal station of *Vanda Sanderiana* is at Davao on the south-east coast of Mindanao, at places growing on trees that overhang the beach, and where the long trailing roots of this orchid are often within reach of the salt spray. It flowered for the first time in this country in the summer of 1883 in the collection of Mr. Lee, at Downside, Leatherhead, since dispersed.

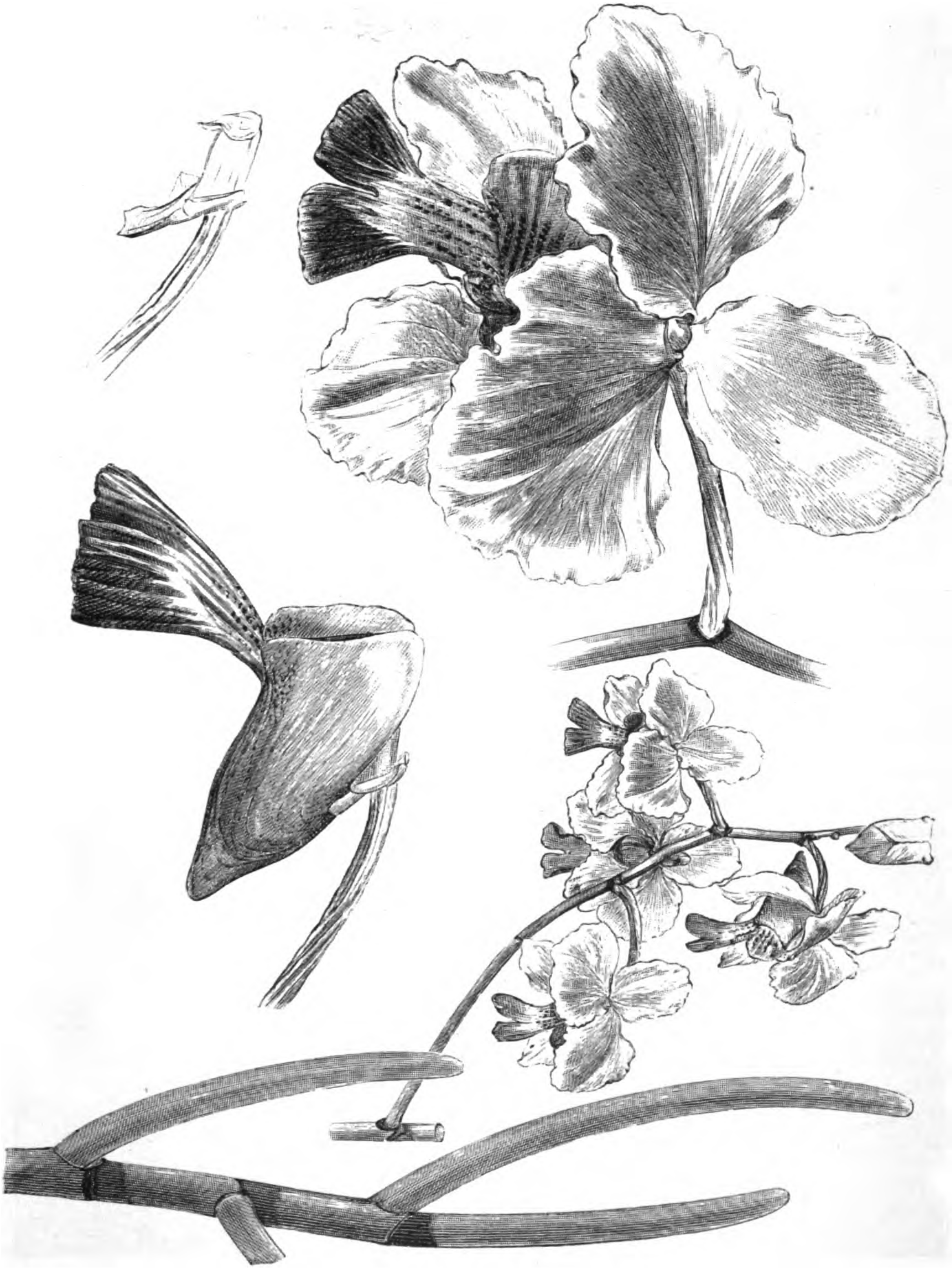
The flowers of *Vanda Sanderiana* show some striking peculiarities—their large flat sepals and petals give them the aspect of a Miltonia, with which genus, however, the affinity is remote; their partially transverse colouration, combined with other characters, is more significant and indicates affinity with *Arachnanthe Cathcartii*. The absence of the spur to the labellum, and the somewhat different attachment of that organ to the column places *V. Sanderiana* on the verge of the genus, connecting it with *Arachnanthe*.

V. teres.

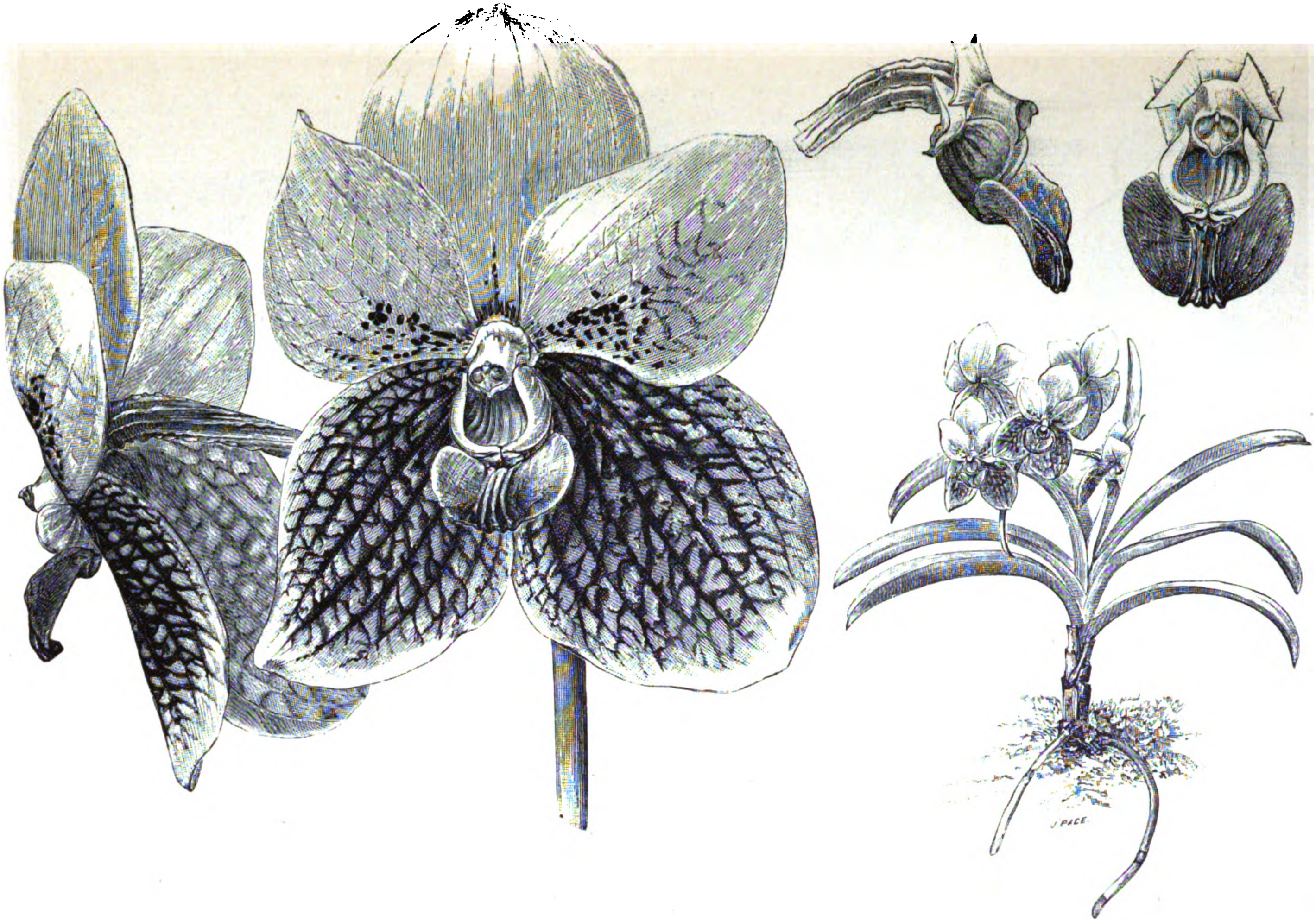
Stems terete, as thick as an ordinary writing pencil, several feet long, but usually much reduced under cultivation. Leaves like the stem, 4—5 inches long, distichously and alternately arranged at an acute angle to it. Peduncles from the upper part of the stem only, and from opposite the leaves, 7—10 inches long, few flowered. Flowers 3—4 inches in diameter on whitish pedicels that are ribbed and twisted; sepals and petals pale rose-purple often suffused with white, the sepals spreading vertically and the petals horizontally; dorsal sepal ovate, obtuse; lateral two sub-rhomboidal, obtuse with a hooked apiculus on the under side near the apex; petals sub-orbicular, a little larger than the dorsal sepal and undulate at the margin; lip three-lobed, the side lobes roundish, convolute over the column, tawny yellow with bands of red spots on the inner side; the front lobe with a broad claw and broadly obcordate blade deeply cleft at the apex, and with the lateral margins revolute, pale rose-purple; spur funnel-shaped, compressed laterally. Column white; anther beaked.

Vanda teres, Lindl. Gen. et. Sp. Orch. p. 217 (1832). Id. Fol. Orch. Vanda No. 16. *Bot. Reg.* t. 1809 (1836). *Bot. Mag.* t. 4114. Paxt. *Mag. Bot. V.* p. 193. Warner's *Sel. Orch. III*, t. 2. Sander's *Reichenbachia, I.* t. 27. Hook. f. Fl. Brit. Ind. VI. p. 49. Dendrobium teres, Roxb. Fl. ind. III. p. 485 (1832).

sub-vars.—*aurorea* (Gard. Chron. XXI. (1884), p. 271), sepals and petals white faintly suffused with light rose-purple, lip light rose, spur pale buff-yellow; *candida* (Williams' *Orch. Alb. IX.* t. 409), sepals and petals white, side lobes of lip and spur pale yellow, front lobe white with a faint flush of light rose on the disk.



Vanda teres.



Vanda Sanderiana.

Vanda teres is widely distributed over north-east India, Assam and Upper Burmah; it is always found in the hot plains and valleys scrambling over the branches of the largest trees and exposed to the full glare of the sun. It was first detected by Dr. Wallich in Sylhet in the early part of the present century, and living plants were brought by him to England about the year 1829, but none of them flowered till 1836; in that year it flowered for the first time in this country in the gardens of the Duke of Northumberland at Syon House. Several variations in the colour of the flowers have since been observed, the two described above being the most distinct that have come under our notice.

Cultural Note.—*Vanda teres* requires a special treatment to induce it to flower regularly, and as this orchid is very successfully cultivated at Tring Park, an outline of the method adopted there will serve better than any formal directions we can give. The plants are cultivated in a half-span house almost exclusively devoted to this Vanda; it forms in fact a compartment of the range in which the Phalænopses are grown at Tring Park, and has therefore the same aspect, that is, it faces nearly due south. The floor of the house is sunk 2 feet below the surface of the ground. A bed, enclosed by brick-work, 3½ feet high and 2½ feet wide extends along the north side of the house, heated by hot-water pipes placed about a foot above the floor of the house, and about a foot above the pipes is fixed a perforated iron stage forming the floor of the bed. The bed is thence 18 inches deep from the top of the brick-work and is filled with broken crocks and charcoal in the proportion of three-fourths of the former and one-fourth of the latter; the depth of the bed is increased by a board 6 inches wide placed on the brick-work, and the layer of crocks and charcoal raised to within 2 or 3 inches of the top of this board. On these the plants are arranged in rows about 6 inches apart with an interval of 4 inches in the row; the space between the rows and plants is filled with fresh sphagnum 2 inches deep; by these means constant saturation and free drainage are efficiently maintained. After the plants are established no shading is used, so that on bright days in summer the temperature often rises from 38°—52° C. (100°—120° F.) when the ventilators are closed, and which are only used in the morning. In winter the lowest temperature is 15°—18° C. (50°—65° F.) During the growing season the plants are constantly syringed. Another set of plants is cultivated in the same way on a lower and narrower bed along the south side of the house, and separated from the higher bed by a pathway, on one side of which is fixed the principal series of pipes for heating the house.

V. tricolor.

Leaves curved, 15—18 inches long, imbricating at base, unequally two-lobed at apex. Racemes stoutish, ascending or spreading, shorter than the leaves, 7—10 or more flowered. Flowers fragrant, fleshy, 2½—3 inches in diameter, on angulate, twisted pedicels 2—3 inches long, white usually stained with pale purple at the base; sepals and petals similar, varying in different plants from obovate-oblong to orbicular-obovate, narrowed into a short claw at the base, undulate, leathery, more or less densely spotted with bright red-brown on a light yellow ground, the spots arranged in longitudinal rows and often confluent, sometimes covering the greater part of the surface, white behind; lip three-lobed, the side lobe sub-quadrate, curved inwards, white; the intermediate lobe sub-panduriform, deeply emarginate, convex above, with three ridges, two of which extend to the apical margin, whitish at the base with some red-brown streaks, the remaining area bright magenta-purple; spur short, compressed, white. Column short, much swollen laterally at the base.

Vanda tricolor, Lindl. in Bot. Reg. 1847, sub. t. 59. Id. in Paxt. *Fl. Gard. II.* t. 42. Id. Fol. Orch. Vanda, No. 10. *Bot. Mag.* t. 4432 (1849). Van Houtte's *Fl. des Serres, VI.* t. 641 (1850). Linden's *Pesc.* t. 42. Warner's *Sel. Orch. II.* t. 39. De Puydt, *Les Orch.* t. 48. Williams' *Orch. Alb. II.* t. 77. V. suaveolens, Blume, Rumph IV. p. 49 (1848).

var.—planilabris.

The front lobe of the labellum less convex with the ridges almost obsolete, the notch in the apical margin shallower, usually magenta-purple with the apical part much paler, but sometimes light rose-purple.

V. tricolor planilabris, Lindl. Fol. Orch. Vanda, No. 10. Id. in Paxt. Fl. Garden, II. sub. t. 42. Williams' *Orch. Alb. II.* t. 87.

var.—suavis.

Racemes longer and bearing more flowers; sepals and petals white with fewer spots that are red-purple; the middle lobe of the lip a little narrower with the margins more reflexed,* the basal half deep purple, the apical half paler.

V. tricolor suavis, supra. V. tricolor, Rchb. in Walp. Ann. VI. p. 866 (1864). V. suavis, Lindl. in Gard. Chron. 1848, p. 351. Id. Fol. Orch. Vanda, No. 9. Rchb. *Xen. Orch.* I. p. 26, t. 12 (1854). Linden's *Pesc.* t. 8. *Bot. Mag.* t. 5174. Van Hontte's *Fl. des Serres*, t. 1604—5 (1862). De Puydt, *Les Orch.* t. 47. Jennings' *Orch.* t. 28. Gard. Chron. XXII. (1884), p. 237. icon. xyl. Williams' *Orch. Alb. IV.* t. 180. Godefroy's *Orchidophile*, 1886, p. 301.

sub-vars.—*Chatsworth* (Williams' *Orch. Alb. VII.* t. 324, sub. *V. suavis*), sepals and petals white densely and evenly spotted with red-purple, basal half of lip deep purple, apical half much paler; *Dalkeith*, sepals and petals pale yellow densely spotted with red-purple in longitudinal rows with occasional interruptions and irregularities, lip bright red-purple with some white streaks at the base; *flava* (Fol. Orch. Vanda, sub.

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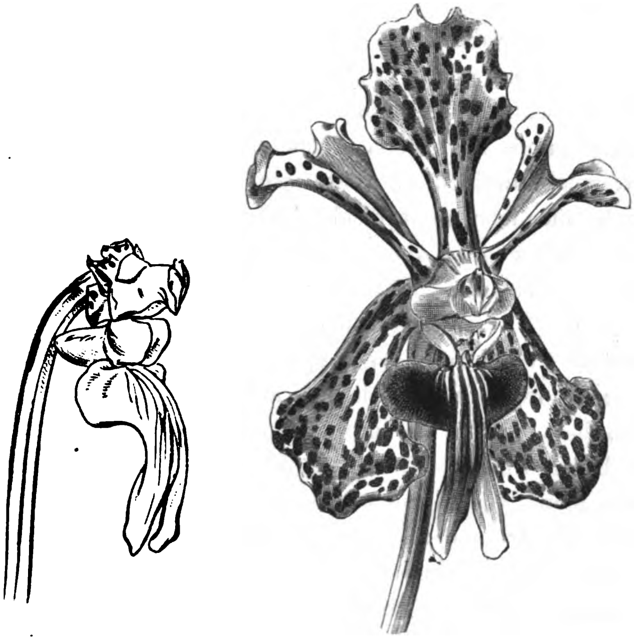
* This character is not constant.

No. 10), "flowers wholly yellow except a faint violet stain on the lip";* *formosa*, sepals and petals bright yellow uniformly covered with oblong red-brown spots arranged in rows that are frequently confluent; *Mr. Dodgson's*, sepals and petals light amber-yellow more sparingly spotted with red-brown than in most of the sub-varieties, lip light magenta-purple; *Mr. Gottschalcke's* (Williams' Manual, p. 608, sub. *V. suavis*), sepals and petals white densely spotted with red-purple, lip rose-purple with white anterior margin; *insignis* (Warner's *Sel. Orch. I.* t. 7), sepals and petals bright yellow regularly spotted with red-brown, lip rose-carmine passing into white at the margin; *Dr. Patterson's* (*The Garden, XXIII.* (1883), t. 375), sepals and petals cream colour much spotted with dark chestnut-brown, the spots confluent at the margin, lip magenta-purple with five slightly divergent white lines at the base, of which the middle one is the longest; *prætexta* (Godefroy's *Orchidophile*, 1886, p. 301), sepals and petals light sulphur-yellow bordered with pale rose, and with broad oblong spots scattered over the yellow area.



Vanda tricolor, var. suavis.

Vanda tricolor was introduced by us from Java in 1846, through

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* This form is unknown to us; that usually cultivated as *Vanda tricolor flava* has the perianth segments sparingly spotted with red-brown as represented in the *Botanical Magazine*, t. 4432.

Thomas Lobb, who had discovered it in the western part of the island, and where it had been detected probably earlier by Dr. Blume, who found it growing on the stems of the sugar Palm (*Arenga saccharifera*), and who described it under the name of *V. suaveolens* in his *Rumphia* published in 1848, but as Dr. Lindley's name has priority of publication, Blume's *suaveolens* must sink as a synonym. It has since been occasionally imported from Java, where it occurs on the hills in the western part of the island at 1,500—2,500 feet elevation, growing chiefly on large trees that were originally planted to shade the now abandoned coffee plantations. From its first introduction, *V. tricolor* has been observed to be very variable in the colour of its flowers, and on account of the high repute in which this orchid has been held by amateurs, many distinguishing names have been given to colour deviations from the type. The most distinct of these are the varieties *planilabris* and *suavis*, which differ from the typical *V. tricolor* in the characters described above. Dr. Lindley gave specific rank to *suavis*, in which he has been followed by horticultural writers, but as it was long since pointed out by Sir W. J. Hooker,* there are no structural differences of sufficient value to separate them specifically. It is always associated with *V. tricolor* in its native home, and is imported mixed with it, but in numbers small in proportion to the type; it was first introduced by us through Thomas Lobb at the same time as *V. tricolor* and was for many years one of the rarest of Vandas in cultivation. The sub-varieties are more difficult to discriminate, and their nomenclature is in great confusion from different forms having received the same name, and the same form different names in different collections. Those described above are for the most part from materials kindly supplied by Baron Schroeder, from his rich collection at The Dell; and by Mr. Owen Thomas, gardener to the Duke of Devonshire, at Chatsworth, and which, we believe, accurately represent the forms originally so named.

V. Vipanii.

Leaves linear, about a foot long, decurved, imbricating at the base, unequally bi-dentate at the apex. Racemes shorter than the leaves, 5—7 flowered. Flowers 2 inches in diameter on white, twisted, grooved pedicels; sepals and petals clawed, undulate, broadly oval, the lateral sepals a little larger, and the petals a little smaller than the dorsal sepal, dark brown tesselated with pale brown, white behind; lip deeply three-lobed, the basal lobes roundish, white spotted and stained with purple; the front lobe cordate at the base, contracted at the middle, and with a deep sinus in the anterior margin, olive green toned with brown, sometimes rose-purple; spur conic, short. Column white.

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* Bot. Mag. sub. t. 5174.

Vanda Vipanii, Rchb. in Gard. Chron. XVIII. (1882). p. 134.

Discovered in Burmah by Captain J. A. Vipan a short time previous to the publication of the name. It is still a very rare and little known species in cultivation. The above description was taken from a plant that flowered in our houses in the summer of 1887.

EXCLUDED SPECIES.

Vanda Batemanii (Lindl.)	now referred to	Stauropsis lissochiloides (Benth.)
Cathcartii (Lindl.)	„ „	Arachnanthe Cathcartii (Benth.)
gigantea (Lindl.)	„ „	Stauropsis gigantea (Benth.)
Lowii (Lindl.)	„ „	Arachnanthe Lowii (Benth.)

SACCOLABIUM.

Blume, Bijdr. p. 292 (1825). Benth. et Hook. Gen. Plant. III. p. 538 (1883).

Saccolabium includes upwards of forty species, most of which are plants of dwarf habit bearing racemes of small flowers offering but little attraction to the cultivator. By far the greatest number of the Saccolabiums inhabit British India, where, in some localities, they are among the commonest of orchids; a few other species known to science are scattered over the Malay Archipelago. Sir J. D. Hooker has distributed the Indian species, including several previously referred to Lindley's Acampe, into seven series each distinguished by some common character observable in the structure of the flower, or in the vegetative organs.[*]

Of the nine species described in the following pages, two, *Saccolabium giganteum* and *S. violaceum*, are aberrant; the first was brought under Saccolabium by Lindley but afterwards removed by him to Vanda;

[*] Fl. Brit. Ind. VI. p. 55. All the Malayan species known to us may be referred to one or other of these series (sections).

the second was described by him as a Vanda but omitted in his monograph of the genus published a few years later in the *Folia Orchidacea*; † three belong to the section CALCEOLARIA of Hooker (*Latilabellatæ* of the *Genera Plantarum*), characterised chiefly by the hemispheric sac of the labellum, of which *S. calceolare* (Lindl.) is the type species, but *S. bellinum* (Rchb.) is the best known in cultivation; and the remaining four to SPECIOSÆ of Hooker (*Genuinæ* of the *Genera Plantarum*) which, as the name implies, includes species with highly coloured flowers, as *S. curvifolium*, *S. ampullaceum*, *etc.*

The characters that mainly distinguish Saccolabium from the allied genera Rhynchostylis, Aërides, and Vanda, are seen chiefly in the form of the labellum and its attachment to the column. Under Rhynchostylis we have stated the characters by which that genus is separated from Saccolabium; from Aërides Saccolabium is separated by the column not being produced into a foot, and the very different form of the spur or sac of the labellum; from Vanda it is chiefly distinguished by the form of the perianth segments, especially of the labellum. These genera, as at present circumscribed, are fairly natural ones; they, however, overlap each other at places along the frontier lines that have been set up between them, so that the placing of the same species under more than one of these genera by different botanists has been inevitable, and hence the number of synonyms that occur in the literary references.

The generic name Saccolabium is derived from *saccus*, "a bag," and *labium*, "a lip," in reference to the saccate labellum, afterwards needlessly altered by its author, Blume, to Saccochilus, from σάκκος and χεῖλος, the Greek equivalents for *saccus* and *labium*.

Cultural Note.—Coming from one of the hottest regions of the globe, and where the season of rest of the vegetation of that region is of very limited duration, the Saccolabiums require the highest temperature usually maintained in the glass-houses of Europe, and a constantly moist atmosphere that should approach saturation during the growing season. Generally speaking the cultural treatment formulated under Aërides is that best suited for Saccolabium and Rhynchostylis.

Saccolabium acutifolium.

Stem as thick as an ordinary writing pencil, not more than a foot high under cultivation. Leaves linear-oblong, sub-acuminate, 4—6 inches long. Racemes much shorter than the leaves, dense, many flowered. Flowers crowded, fleshy, ¾ inch in diameter; sepals and petals light greenish yellow spotted with red-brown, obovate-oblong, obtuse, the petals a little the narrowest; lip a sub-globose almost hemispheric sac that is bright yellow spotted with red, and a small triangular whitish blade fringed with glandular hairs. Column very short, stained with pale purple.

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† They are retained under Saccolabium by Bentham, Gen. Plant. III. p. 579, but referred to Vanda by Sir J. D. Hooker, Fl. Brit. Ind. VI. p. 58.

Saccolabium acutifolium, Lindl. Gen. et Sp. Orch. p. 223 (1832). Id. *Sert. Orch.* Frontisp. No. 2. Id. in Journ. Linn. Soc. III. p. 33. Hook. f. Fl. Brit. Ind. VI. p. 61. S. denticulatum, Paxt. *Mag. Bot. VII.* p. 145 (1840). *Bot. Mag.* t. 4772.

A native of Sikkim and the Khasia Hills, whence it is occasionally imported with other orchids. It was first cultivated by the Rev. J. Clowes, of Broughton Hall near Manchester, about the year 1837, and very shortly afterwards it was introduced to Chatsworth by Gibson. It much resembles on superficial view a miniature *Saccolabium bellinum,* to which species it is inferior in beauty. It is easily distinguished among the cultivated Saccolabiums by its sharply pointed leaves that are often obliquely twisted.

S. ampullaceum.

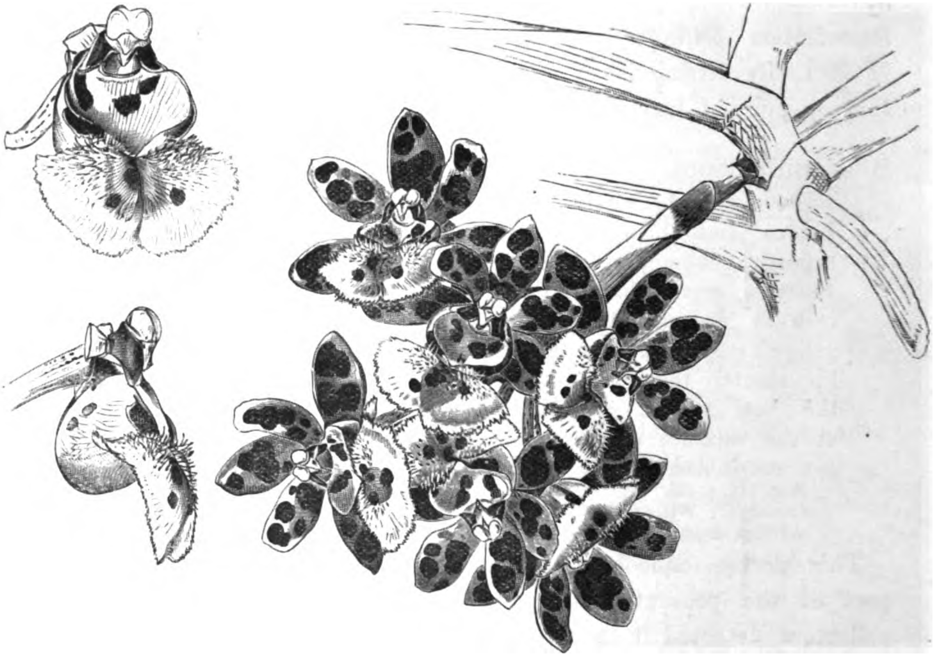
Stems short, rarely exceeding 6 inches high under cultivation. Leaves linear-ligulate, 5—6 inches long, channelled above, keeled beneath, obliquely truncate and irregularly toothed at the apex. Racemes erect, shorter than the leaves. Flowers crowded, about $\frac{3}{4}$ inch in diameter, bright rose-carmine, the column white and anther yellow; sepals and petals similar and sub-equal, obovate, spreading; lip shorter than the other segments, linear, reflexed, produced at the base into a cylindric, compressed spur longer than the blade, at the entrance of which are two rounded protuberances.

Saccolabium ampullaceum, Lindl. *Sert. Orch.* t. 17 (1838). Id. in Journ. Linn. Soc. III. p. 35. Paxt. *Mag. Bot. XIII.* p. 49. *Bot. Mag.* t. 5595. *Fl. Mag.* t. 393 (roseum). Williams' *Orch. Alb. IV.* t. 191. Hook. f. Fl. Brit. Ind. VI. p. 64. Aërides ampullaceum, Roxb. Fl. ind. III. p. 476 (1832).

This pretty Saccolabium became known to science in the early part of the present century through Dr. Roxburgh, one of whose collectors detected it in Sylhet some time prior to 1814, the date of Dr. Roxburgh's death. It was subsequently gathered by various Indian botanical explorers in the tropical Himalaya, along which it occurs at 1,000—3,000 feet elevation from Nepal eastwards. It has also been reported from Burmah and Tenasserim. The earliest notice of it as a horticultural plant occurs in Paxton's *Magazine of Botany* for 1847, where is figured one of the plants brought by Gibson from the foot of the Khasia Hills to Chatsworth in 1837. Dr. Lindley's plate in the *Sertum Orchidaceum,* although published nearly ten years earlier, was copied from a drawing in the possession of the East India Company by a native artist. *Saccolabium ampullaceum* first became generally distributed among the orchid collections of this country through an importation of Messrs. Low and Co. about the year 1865.

S. bellinum.

Stems but a few inches high. Leaves strap-shaped, 7—12 inches long, bi-lobate at the apex. Peduncles stoutish, 3—4 inches long, recurved, few flowered. Flowers sub-corymbose, somewhat crowded, fleshy, 1¼ inch in diameter; sepals and petals spreading and slightly incurved, similar and sub-equal, obovate-oblong, yellow blotched with blackish purple; lip a sub-globose sac and semi-lunate blade, the sac white with a few purple spots on the basal concave side, and with a large ochreous blotch in the centre; the blade two-lobed, papillose or pubescent above, fimbriate-denticulate at the margin, whitish with an orange-yellow disk, spotted with purple. Column very short; anther with a short, broad beak.



Saccolabium bellinum.

Saccolabium bellinum, Rchb. in Gard. Chron. XXI. (1884), p. 174. Williams' *Orch. Alb. IV.* t. 156. *Bot. Mag.* t. 7142. Hook. f. Fl. Brit. Ind. VI. p. 61.

Discovered in 1873 by Boxall in Burmah, and introduced by Messrs. Low and Co. It is the most generally cultivated of the calceolate Saccolabiums, and the handsomest known of all of them. Botanically it much resembles a large state of *Saccolabium calceolare*, the type of the section, a species with small, inattractive flowers very common in the tropical Himalaya; that and *S. bellinum* may be regarded as the extremes of a series that are, in part, connected by *S. intermedium* and *S. acutifolium*.*

S. bigibbum.

"Stem very short. Leaves few, linear-oblong, 3—4 inches long and 1 inch broad, bifid at the apex. Racemes shorter than the leaves, almost corymbiform, drooping, many flowered. Flowers pale yellow with faint red markings on the edge of the spur; sepals and petals similar, spreading, spathulate, obtuse or sub-acute with a broad flat claw; sac of lip large in proportion to the size of the flower, sub-hemispherical and laterally compressed; blade broadly triangular with erose and ciliated margins."—*Botanical Magazine.*

Saccolabium bigibbum, Rchb. in *Bot. Mag.* sub. t. 5767 (1869). Id. Otia Hamburg, p. 43 (1878). Hook. f. Fl. Brit. Ind. VI. p. 61.

Discovered by General Benson in Lower Burmah and introduced by us through him in 1868. It is a dwarf plant with light yellow flowers and is still occasionally imported with other Burmese orchids.

S. curvifolium.

Stem short and stoutish, ligneous below, sheathed above by the imbricating bases of the crowded leaves. Leaves linear, 7—10 inches long, decurved, premorse and bi-dentate at the apex. Racemes erect, many flowered. Flowers crowded, about an inch across vertically, bright cinnabar-red; sepals and petals similar, obovate-oblong, sub-acute; lip linear-oblong, truncately emarginate, with a light orange keel and two tubercles at the base, where it is produced into a slender cylindric spur, at the entrance of which on each side is a short, roundish, erect lobe. Column short, cinnabar-red; anther purple.

Saccolabium curvifolium, Lindl. Gen. et Sp. Orch. p. 222 (1832). *Illus. hort.* XII. t. 493 (1866). De Puydt, *Les Orch.* t. 38 (1880). Williams' *Orch. Alb. III.* t. 107. Hook. f. Fl. Brit. Ind. VI. p. 65. S. rubrum, Lindl. Gen. et Sp. Orch. p. 222. S. miniatum, *Bot. Mag.* t. 5326 (not Lindl.).

Both the botanical and horticultural history of this plant is somewhat confused from its having been mixed up with that of *Saccolabium miniatum*, a species from Java with flowers of nearly the same colour and structure. It is certain, however, that *S. curvifolium* was first made known to science by Dr. Wallich, who discovered it in the early part of the present century in the eastern tropical Himalaya, where it was afterwards gathered by Griffith and other Indian botanists, and whence it was subsequently introduced into European gardens. The earliest record we find of its flowering in this country is in the *Botanical Magazine*, sub. t. 5326, where it is stated to have flowered in the Royal Gardens at Kew in the summer of 1862. It was shortly afterwards imported by Messrs. Low and Co., and thence became generally distributed among the orchid collections of Europe. *S. curvifolium* has the most richly-coloured flowers in the genus; although always of a bright red, they vary in the shade of colouring from light orange-scarlet to deep cinnabar-red. The flowering season is May and June.

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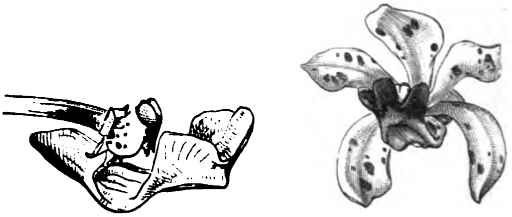
* See Sir J. D. Hooker's *Flora of British India, VI. p.* 61.

S. giganteum.

Stem as thick as a man's forefinger, seldom exceeding a few inches high under cultivation. Leaves broadly ligulate, 9—12 inches long and 2—3 inches broad, sheathing at the base, unequally two-lobed at the apex, very leathery, bright green with paler longitudinal lines on both sides. Racemes drooping, as long as the leaves. Flowers fragrant, on short white pedicels, at the base of which is a small shrivelled bract; sepals oval-oblong, white with a few amethyst-purple spots; petals narrower, oblong, acute, white with an apical-purple spot; lip oblong, undulate, produced backwards into a short funnel-shaped compressed spur, and with three lobes at the free end, of which the lateral two are rounded and the middle one narrowly oblong, bright amethyst-purple with darker veins. Column green spotted with purple.


Saccolabium giganteum.

Saccolabium giganteum, Lindl. Gen. et Sp. Orch. p. 221 (1832). *Bot. Mag.* t. 5635 (1867). Jennings' *Orch.* t. 8. Williams' *Orch. Alb. II.* t. 56. Sander's *Reichenbachia, I.* t. 22. Vanda densiflora, Lindl. in Paxt. Fl. Gard. sub. t. 42 (1851). Id. Fol. Orch. Vanda, No. 22 (1853). Gard. Chron. 1862, p. 1194. Van Houtte's *Fl. des Serres, XVII.* t. 1765. Hook. f. Fl. Brit. Ind. VI. p. 53.

var.—illustre.

Racemes somewhat longer, with the flowers more loosely arranged; the flowers larger and more brightly coloured, especially the labellum.

S. giganteum illustre, Rchb. in Gard. Chron. XXI. (1884), p. 44. *Illus. hort.* s. 3, t. 517.

sub-var.—*Mr. Petot's* (Rchb. in Gard. Chron. XXIV. (1885), p. 746. Godefroy's *Orchidophile*, 1886, p. 163), the perianth segments wholly white.

Saccolabium giganteum first became known to science in the early part of the present century through Dr. Wallich, who received from one of his collectors a dried specimen gathered near Prome in Lower Burmah. Nothing more was seen of it till 1859, when the late Dr. Sumner, Bishop of Winchester, received some plants from a friend in Burmah, one of which flowered for the first time in the bishop's garden at Farnham Castle in the autumn of 1862. It continued to be extremely rare till re-introduced by us in 1866, through Colonel (now General) Benson, who has communicated the following particulars of its habitat:—

> "*Saccolabium giganteum* is not found in Rangoon or Moulmein or south of that place,* but travelling northwards beyond the extreme influence of the south-west monsoon, the plant appears first in small quantities and of small size, but on approaching the drier climate of Prome and Thayetmyo, where the hot winds blow and where the thermometer in the dry season is about 45° C. (112° F.) in the shade, the plant is found in great profusion and luxuriance on trees in a deciduous jungle, exposed to the rays of a tropical sun, and in most cases with its leaves scorched.†"

The variety *illustre*, of which the varietal characters are not very clearly defined, is said to have been introduced by M. Linden in 1882-3. The sub-variety is a white-flowered form discovered by the late Auguste Regnier in Cochin China, and introduced by M. Godefroy, of Argenteuil, who states in his *Orchidophile* that *Saccolabium giganteum* is one of the commonest orchids of that country, growing on trees along the skirts of the forest, sometimes on the highest branches; when in flower its powerful fragrance always makes its presence known.

S. Hendersonianum.

Stem very short, with 3—5 or more narrowly ligulate, sub-acute, curved leaves, 3—5 inches long. Racemes erect, as long as the leaves, many flowered. Flowers crowded, bright rose colour with a paler lip and spur, on short, pale green pedicels, at the base of which is a small triangular bract; dorsal sepal sub-orbicular, concave, the lateral two larger, obovate-oblong; petals obovate, smaller than the lateral sepals; lip reduced to a compressed, cylindric, slightly falcate spur, at the mouth of which are three small teeth representing the lobes.

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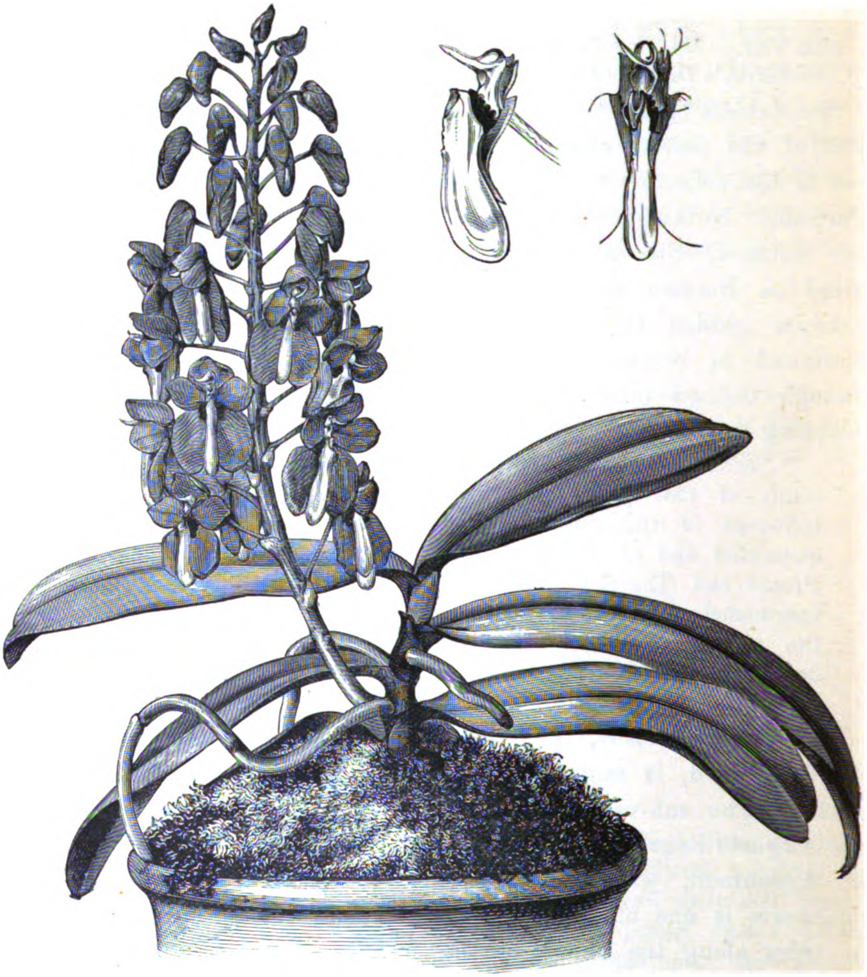
* *Id est*, within the British territories.

† Gard. Chron. 1870, p. 811.



Saccolabium Hendersonianum.

Saccolabium Hendersonianum, Rchb. in Gard. Chron. IV. (1875), p. 356. *Bot. Mag.* t. 6222. Williams' *Orch. Alb. VI.* t. 275.

Imported in 1874 by Messrs. Henderson, of the Wellington

Nursery, at St. John's Wood, who gave no locality. In the *Botanical Magazine*, sub. t. 6222, it is stated, on the authority of the late Professor Reichenbach, to have been in Europe ever since 1862. It has since been gathered in north-west Borneo by Curtis, who informs us that it prefers the neighbourhood of rivers and streams, where it grows on trees of *Lagerstrœmia indica*, generally in partial shade, but sometimes fully exposed. In its native home it flowers very freely, and one of the prettiest floral sights he met with in that region was a dead, leafless tree overhanging a stream covered with *Saccolabium Hendersonianum* in full bloom.

S. miniatum.

Stem very short. Leaves linear, 3—4 inches long, strongly keeled beneath, imbricate at base, obliquely truncate, or unequally two-lobed at apex. Racemes erect, as long as the leaves, 10—15 flowered. Flowers about ¾ inch in diameter, bright orange-red; sepals and petals ovate-oblong, acute; lip linear-oblong, obtuse, recurved, produced at the base into a slender cylindric spur longer than the limb, on each side of the aperture of which are two small auricles. Column very short; anther purple.

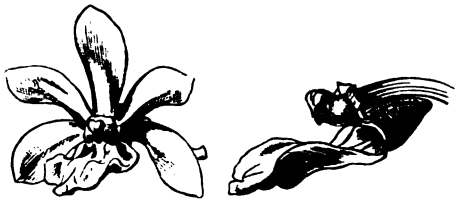
Saccolabium miniatum, Lindl. in Bot. Reg. 1847, sub. t. 26. *Id.* t. 58. Miquel, Fl. Ind. bat. III. p. 692.

Introduced by us from Java in 1846 through Thomas Lobb, but now very rarely seen in the orchid collections of this country. It is very near *Saccolabium curvifolium*, from which it is chiefly distinguished by its smaller size, shorter and narrower leaves, and its shorter racemes of smaller flowers with differently shaped perianth segments.

S. violaceum.

Stem as thick as a man's little finger, rarely exceeding 10—15 inches high under cultivation. Leaves broadly strap-shaped, decurved, very leathery, 9—12 inches long, 1—1½ inch broad, imbricate at base, unequally bi-lobed at apex, with pale longitudinal striations beneath. Racemes pendulous, shorter than the leaves, many flowered. Flowers fragrant, about an inch in diameter, on short grooved pedicels; sepals oval-oblong, the lateral two broader than the dorsal one; petals similar but narrower; both sepals and petals white spotted with amethyst-purple; lip amethyst-purple, oblong, undulate, with a small oblong lobule at the apex, depressed at the middle, below which are three broad ridges; spur sub-conic, compressed, green. Column terete, very short; anther beaked.

Saccolabium violaceum, Lindl. ex. Warner's *Sel. Orch. I.* t. 14 (1862–65). De Puydt, *Les Orch.* t. 39. Vanda violacea, Lindl. in *Bot. Reg.* 1847, t. 30.



Saccolabium violaceum (Mr. Harrison's variety).

sub-var.—*Mr. Harrison's* (*Bot. Mag.* t. 5433. Williams' *Orch. Alb. V.* t. 236), perianth segments wholly white, column green, anther yellow.

Discovered by Cuming near Manila, and sent by him to Messrs. Loddiges, of Hackney, about 1840. It is now known to be quite common throughout the Philippine Islands, always occurring in hot, damp valleys, often on the Mangroves growing in the swamps along the coast. The sub-variety was communicated to the Royal Gardens at Kew in 1863 by Messrs. Low and Co., who imported it from the island of Pulo-copang in the China Sea (not found on any map within our reach), and named it in compliment to Mr. C. H. Harrison, "a gentleman greatly interested in the introduction and cultivation of Indian orchids." The nearest affinity of *Saccolabium violaceum* is the Burmese *S. giganteum,* from which it differs chiefly in the form of the labellum. It usually flowers in the early spring.

EXCLUDED SPECIES.

Saccolabium Blumei (Lindl.),	now	referred to	Rhynchostylis	retusa (Blume.)
cœleste (Rchb.)	„	„	„	cœlestis (Rchb.)
guttatum (Lindl.)	„	„	„	retusa (Blume).
præmorsum (Hort.)	„	„	„	„

ANGRÆCUM.

Thouars, Fl. des Iles. Afr. tab. 48 (1822). Benth. et Hook. Gen. Plant. III. p. 583 (1883).

The most noticeable character presented by Angræcum on a superficial inspection of the cultivated species, is unquestionably the long tail-like spur dependent from the base of the labellum. This curious appendage is that by which the Angræcums are most readily recognised by horticulturists, but remarkable as it is, it is also present in other orchids allied to them, as Cryptopus, Mystacidium, etc., and is not thence of itself sufficient for the limitation of the genus; other characters must be joined with it to admit of Angræcum being defined in such a way that the included species may form a natural group; these additional characters are found in the labellum and column, and may be thus technically described.

The *labellum* is affixed to the base of the column, the lateral lobes are very small or obsolete, and the blade is spreading and usually entire.

The *column* is very short and wingless; the caudicle of the pollinia is flat, single, or double; the rostellum is entire or deeply cleft (two-lobed).

The caudicle of the pollinia and its gland combined with the form of labellum afford excellent characters for a sectional division of the genus, and upon them Mr. Bentham has established the three following:—[*]

I.—Macroura. Lamina of the labellum flat, often broad; the pollen masses each with a distinct caudicle and gland.

This includes *Leonis*, *sesquipedale*, and a few others not in cultivation.

II.—Listrostachys. Lamina of the labellum usually continuous with the spur, more or less concave at the base and tapering into a point; the pollen masses attached to distinct caudicles, the glands either distinct or more or less united.

The species of this section best known in cultivation are *arcuatum*, *caudatum*, *Chailluanum*, *pellucidum*, *pertusum*.

III.—Euangræcum. Lamina of the labellum flat, the caudicle of the pollen masses narrow, single, and entire.

This section includes *articulatum*, *bilobum*, *citratum*, *eburneum*, *Ellisii*, *falcatum*, *fastuosum*, *modestum*, and many others.

Although of considerable interest from a botanical point of view, the above sectional divisions have no practical bearing on the cultural treatment of the species included in them.

[*] Gen. Plant. III. p. 583.

In their vegetation the Angræcums conform to the sub-tribal characters described at the beginning of this section, but they vary considerably in habit *inter se*, thus *Angræcum eburneum* is one of the most robust orchids known, while *A. hyaloides* is one of the smallest. *A. sesquipedale* and *A. caudatum* are about midway between them as regards size; and nearly all the other cultivated species stand, in this respect, between these and *A. hyaloides*.

The *leaves* in the taller species are strap-shaped, complicate at the base and truncate or unequally two-lobed at the apex; in the dwarfer species they are much shorter, usually oval-oblong, or some modification of that form, obtuse or obliquely two-lobed at the apex; in all the species very coriaceous in texture, and deep green in colour. The equitant leaves of *Angræcum Leonis* and the terete ones of *A. Scottianum* are the most obvious deviations among the cultivated species.

The *inflorescence* is usually racemose, but in *Angræcum fragrans*, *A. Germinyanum*, and a few other species not in cultivation, the flowers are solitary. The racemes are few or many flowered, in the latter case the arrangement of the flowers along the rachis is extremely formal, being produced from the joints alternately and distichously and also secund, that is, all turned towards the same side as in *A. citratum*, *A. pertusum*, etc.

A peculiarity occurs in the few-flowered and in some of the many-flowered racemes that must here be noticed; the apical flower expands first and the others follow in centripetal order, the lowermost flower opening last, which is the reverse of what takes place in the racemes of the best known genera in this sub-tribe. Moreover, the apical flower, so far as this phenomenon has been observed by us, is the largest, followed by a gradual diminution of size downwards (*Angræcum Ellisii*, *A. modestum*, *A. sesquipedale*, etc.).

The generic name is a Latinised form of Angrek, the Malay name for all orchids of the Aërides and Vanda habit of growth. The number of species has been variously estimated from twenty-five to sixty according to the views held by different botanists respecting the circumscription of the genus. As defined in the *Genera Plantarum* the number of the included species at present known to science may be estimated at fifty.

Geographical distribution.—Nearly one-half of the cultivated Angræcums are natives of Madagascar, where they and other species known to science form the most prominent feature of the ORCHIDEÆ of that great island. Three remarkable species have been introduced from the Comoro islands, a small group to the north-west of

Madagascar, and several others are known to inhabit the Mascarene islands (Mauritius, Bourbon). The greater number of the known species are therefore concentrated within a comparatively limited area; these are all insular and presumably quite local. Our information respecting the dispersion of the species indigenous to the African continent is still very imperfect. In south Africa (extra-tropical) seven or eight species occur, including *A. arcuatum,* all of which are quite local, while the tropical species, *A. Kotshyi,* has been reported from the country of the sources of the Nile and from the neighbourhood of the Zambesi, places that are upwards of 2,000 miles distant from each other. Seven or eight species have been introduced from the west coast of Africa, chiefly from Sierra Leone, of which four are still in cultivation, including the sombre *A. caudatum,* and others are known as herbarium specimens. One of the west African Angræcums, *A. bilobum,* has recently been discovered to be represented by a variety in Zanzibar, separated from the type by the whole breadth of the continent at its widest part. Two or three species were discovered by Dr. Welwitsch in Angola, and one by Schimpfer in Abyssinia. The assumption that the Angræcums may be generally spread over tropical Africa, where the climatic conditions are suited to orchid life, thence appears to us to be a perfectly logical one. The most surprising fact, however, in the geographical distribution of Angræcum is the presence of *A. falcatum* in Japan, a species with all the essential characters of a true Angræcum, but separated from its congeners by an interval equal to one-fourth of the circumference of the globe.

Cultural Note.—The geographical stations of the Angræcums and their environment *in situ,* where known, should indicate the cultural treatment of the plants in the glass houses of Europe. Coming from one of the hottest regions of the globe, they require the highest temperature usually maintained in the orchid houses of this country, such as the East Indian house, and where a highly humid atmosphere is kept up during the growing season, and where shading is used on bright days in summer. The dwarf species may be grown in teak baskets suspended near the roof-glass, or, where a pure atmosphere is always available, on a teak raft surfaced with sphagnum that can be always kept moist. We have seen the latter method, which appears to be that most natural to the plants, very successfully practised by cultivators whose houses are situated beyond the influence of London fog. Although *Angræcum arcuatum* and *A. falcatum* are extra-tropical species they thrive well in the coolest part of the East Indian house suspended near the roof-glass.

SYNOPSIS OF SPECIES AND VARIETIES.

Angræcum arcuatum.

Stems 2—5 inches high, about as thick as an ordinary writing pencil, leafy from the base. Leaves narrowly oblong, 3—4 inches long, very leathery, emarginate, or unequally bi-lobed at the apex. Racemes as long as the leaves, few flowered. Flowers white on short green triquetral pedicels sheathed at the base by a triangular brown bract; sepals and petals linear-lanceolate, grooved on the face, very acuminate, reflexed, the sepals broader than the petals; lip similar to the petals but shorter and more fleshy; spur large for the size of the flower, greenish, recurved towards the tip. Column very short.

Angræcum arcuatum, Lindl. in Comp. Bot. Mag. II. p. 204 (1836). Id. in Paxt. Fl. Gard. II. p. 120 (1852). Harv. Thes. Cap. II. p. 5, t. 107 (1863). Bolus in Journ. Linn. Soc. XIX. p. 338 (name only). Listrostachys arcuata, Rchb. in Walp. Ann. VI. p. 907.

A native of the Albany district in the extreme south-east of Cape Colony, growing on low trees and limestone rocks in the neighbourhood of Graham's Town, where it was first discovered by the botanical traveller, Burchell, in the early part of the present century. It was introduced by us in 1851; it flowers in the spring months.

A. articulatum.

Stem thickish, 3—5 inches high in the cultivated plants. Leaves oval or obovate-oblong, 3—5 inches long and 1—1½ inch broad, emarginate or obliquely two-lobed at the apex, very leathery. Peduncles stoutish, pale green, jointed at intervals of about half-an-inch, 9—15 inches long, pendulous, racemose from near the base. Flowers pure white, about 1½ inch in diameter, on short, pale orange-red pedicels; the dorsal sepal and petals elliptic-oblong, acute, the lateral sepals similar but narrower; lip broadly oval-oblong, acute, larger than the other segments; spur 3—4 inches long.

Angræcum articulatum, Rchb. in Gard. Chron. 1872, p. 73. Sander's *Reichenbachia, II.* t. 55. A. descendens, Rchb. in Gard. Chron. XVII. (1882), p. 558.

Discovered by the Rev. W. Ellis during his second missionary visit to Madagascar. He succeeded in bringing home only three plants alive, which he cultivated at Rose Hill, Hoddesden, Herts, where he resided after his return to England, but they were subsequently acquired by the late Mr. John Day. Materials for description were supplied to the late Professor Reichenbach from Hoddesden towards the end of the year 1871, which is the earliest evidence extant of its flowering in this country. It continued to be very rare in the orchid collections of Europe till recent importations caused it to become more generally distributed. As distinguished from its nearest congener, *Angræcum Ellisii*, it is a much smaller plant with shorter leaves and somewhat smaller flowers with a much shorter spur. It flowers in March and April.

A. bilobum.

Stem 3—5 inches high, as thick as an ordinary writing pencil. Leaves obovate-oblong, 4—5 inches long, unequally bi-lobed at the apex. Racemes drooping, as long again as the leaves, 7—10 flowered. Flowers white, about an inch in diameter, on reddish brown pedicels with a small acute bract at their base; sepals, petals and lip nearly uniform, lanceolate, acuminate, the petals a little narrower and the lip a little broader than the sepals; spur slender, longer than the pedicel and ovary, pale orange-red. Column short, sub-triquetral.

Angræcum bilobum, Lindl. in Bot. Reg. 1840, misc. No. 151. *Id.* 1841, t. 35. Rchb. in Walp. Ann. VI. p. 904. A. apiculatum, Hook. in *Bot. Mag.* t. 4159 (1845).

var.—Kirkii.*

Leaves narrower and slightly dilated at the apex. Racemes shorter with fewer flowers. Flowers with somewhat narrower segments.

A. bilobum Kirkii, Rchb. in Gard. Chron. XVIII. (1882), p. 488. Williams' *Orch. Alb. IV.* t. 162.

First discovered by Mr. Bowdich at Cape Coast Castle, on the west coast of Africa, some time prior to 1840, in which year it flowered in Messrs. Loddiges' nursery at Hackney. Four years later it was introduced to the Royal Gardens at Kew from Sierra Leone, whence it has been since occasionally imported with other orchids. The variety *Kirkii* was sent to the late Mr. B. S. Williams, from Zanzibar, by Sir John Kirk in 1881. According to the late Professor Reichenbach it had been previously sent by the German botanical traveller Hildebrandt from east Africa to the Botanic Garden at Hamburgh, where it flowered in 1875. The presence of this species on the two opposite coasts of the African continent, separated by an interval of upwards of 3,000 miles, is a remarkable fact in its geographical distribution.

A. caudatum.

Stem as thick as the little finger, 8—12 inches high in plants observed, leafy from the base and emitting cord-like roots 2—3 feet long, whose growing points have a glaucous hue unlike any other cultivated Angræcum. Leaves crowded, broadly strap-shaped, 12—15 inches long and 1½ inch broad, recurved, closely imbricating at base, unequally bi-lobed at apex. Peduncles spreading, or slightly depressed,

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* Not seen by us.

18—21 inches long, brownish green, jointed, with a short, cylindric, appressed bract at each joint, racemose and zig-zag along the distal two-thirds, 5—7 or more flowered. Flowers distant, inverted, 3 inches across vertically; sepals and petals similar and sub-equal, linear-lanceolate, acuminate, with slightly revolute margins and incurved tips, olive-green toned with pale brown; lip clawed, obcordate-cuneate with a green awl-shaped apical mucro, the claw channelled at the entrance of the flexuose, pale brown spur that is 8—9 inches long. Column terete, brown, the rostellum prolonged into an awl-shaped red-brown beak; the anther also beaked, the beak of the anther shorter than that of the rostellum and appressed to it.

Angræcum caudatum, Lindl. in *Bot. Reg.* t. 1844 (1836). *Bot. Mag.* t. 4370. Sander's *Reichenbachia II.* t. 67. Godefroy's *Orchidophile*, 1887, p. 80. Williams' *Orch. Alb. VIII.* t. 358. *The Garden*, XXXIX. (1891), t. 804. Listrostachys caudata, Rchb. in Walp. Ann. VI. p. 907 (1864).

A native of Sierra Leone, whence it was introduced about the year 1834, by Messrs. Loddiges, in whose nursery at Hackney it flowered for the first time in this country in August of the following year. It appears to have been subsequently imported in limited numbers, as it was generally cultivated by the most prominent amateurs of the period 1840—60,* among whom it was in high repute on account of its very curious flowers, of which the unusual colour, the long tails, and the remarkable sexual apparatus are striking peculiarities. It has since become quite rare in British gardens, and at the present time it is represented in but few collections.

A. Chailluanum.

Stems as thick as the little finger, 6—10 or more inches high. Leaves linear-oblong, 5—8 inches long, 1½ inch broad, loosely imbricate at base, unequally two-lobed at the apex. Peduncles as long as the leaves, drooping, racemose, 6—10 flowered. Flowers milk-white, with a brownish boat-shaped bract at the base of the stalked ovary; "sepals, petals, and lip, all of equal length and similar, narrow, lanceolate-subulate with slender, acuminate, recurved points; spur slender, flexuose, 4 inches long, greenish." Column short, with both rostellum and anther beaked, the beak of the latter the shortest.

Angræcum Chailluanum, Hook. f. in *Bot. Mag.* t. 5589 (1866).

Sent from the Gaboon in West Africa, in 1865, to the Royal Gardens at Kew by M. du Chaillu, and also from the Nun river on the same coast by M. Gustav Mann, collector for the Royal

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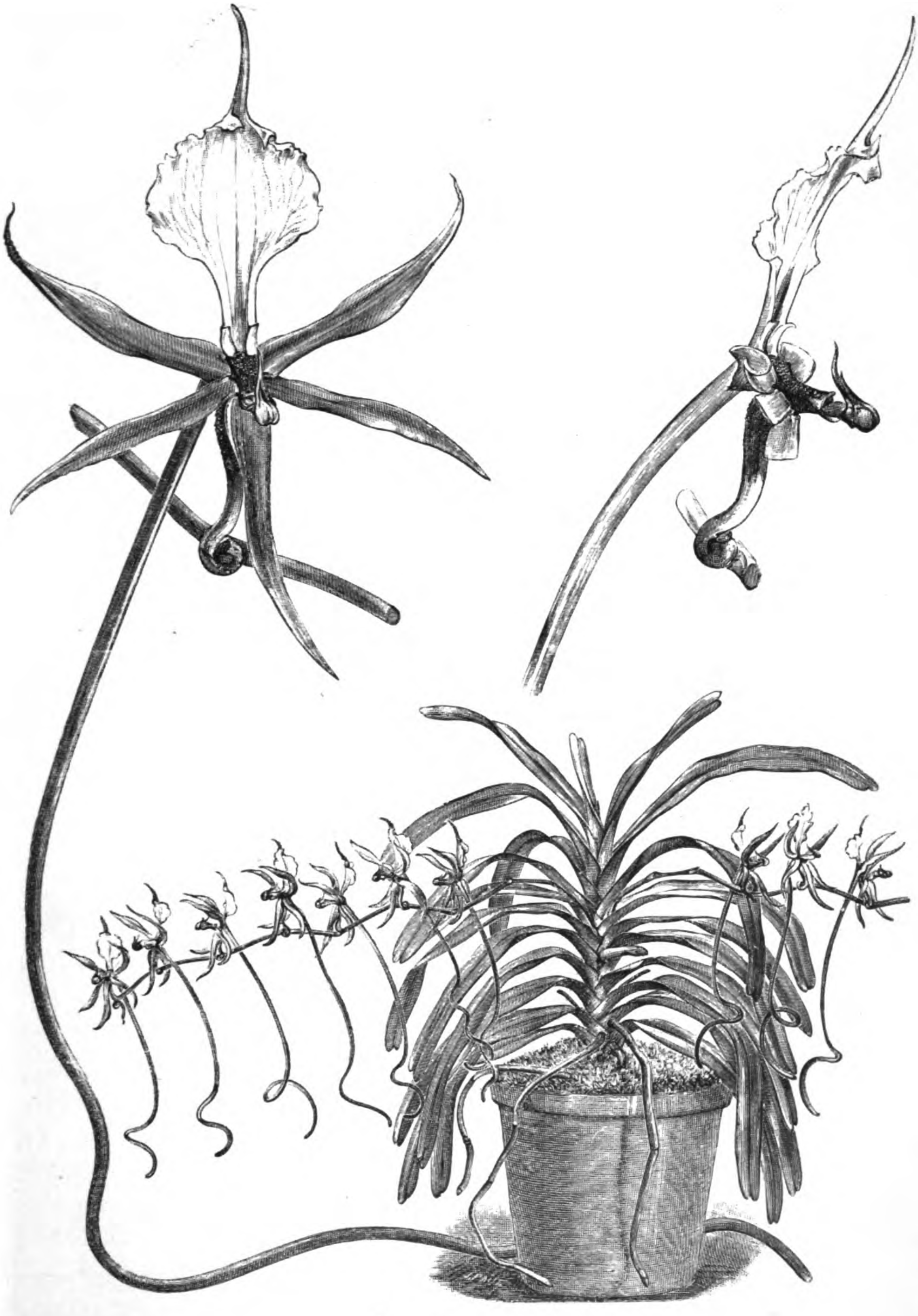
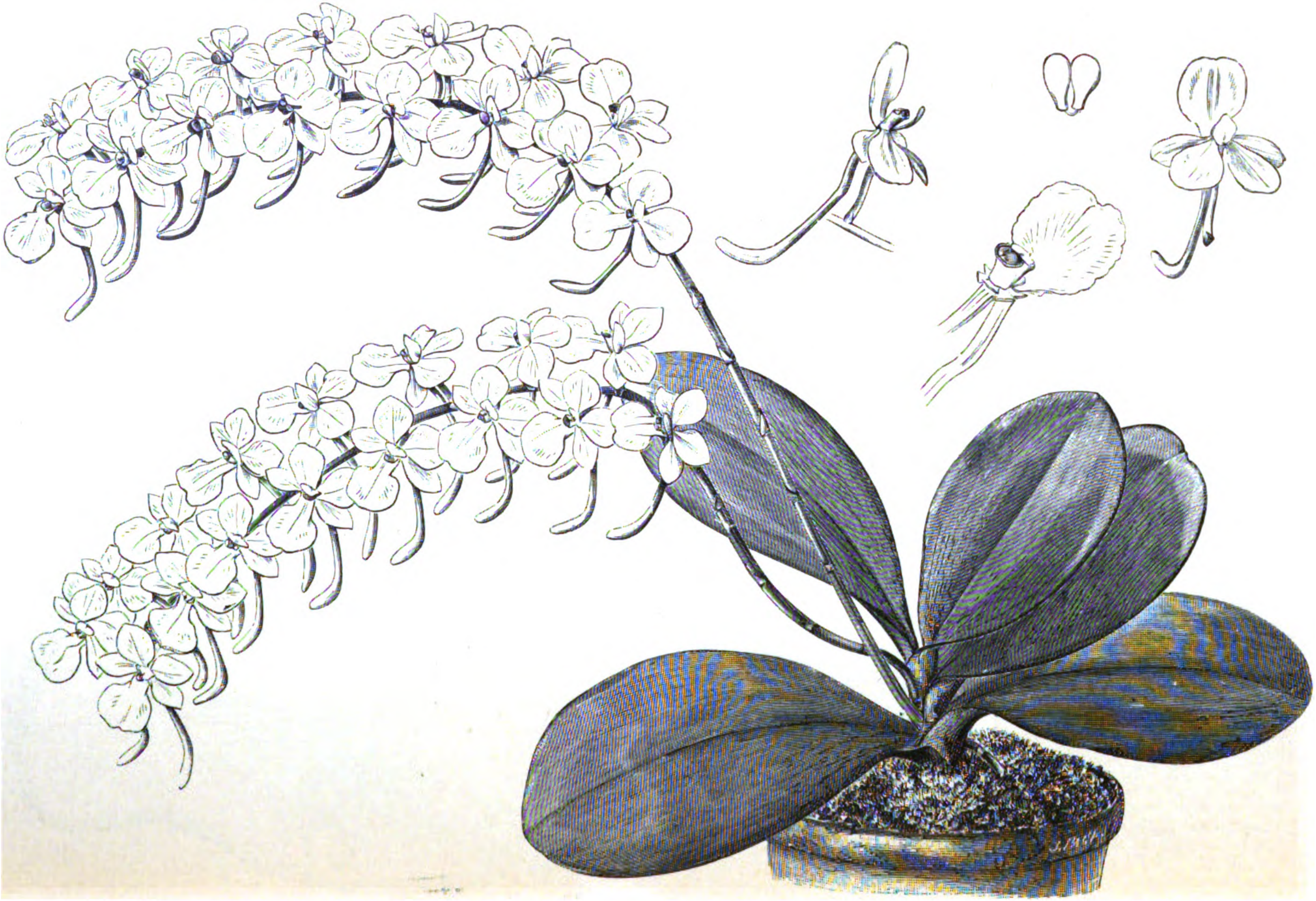
* Mr. James Bateman, Mr. Sigismund Rucker, Mr. George Barker, Mr. John Day, Mr. J. H. Schroeder, Sir Charles Lemon, and others.


Angræcum caudatum.



Angræcum citratum.

Gardens. It is near the South African species *Angræcum arcuatum*, to which it was at first referred by Dr. Lindley.

A. citratum.

Stems short, rarely exceeding 3—4 inches high in the orchid houses of this country, with six—ten ovate or ovate-oblong leaves, 3—5 inches long, and 1—1½ inch broad, acute or unequally lobed at the apex. Racemes pendulous, 15—20 or more inches long. Flowers ¾ inch in diameter, of a uniform French-white or pale straw colour, on short pedicels, all turned upwards and rather close set (distichous and secund) along the rachis; sepals broadly obovate, obtuse; petals elliptic-oblong, narrower than the sepals; lip with a short claw and sub-orbicular, emarginate, flat blade; spur slender, twice as long as the pedicel. Column very short and thick.

Angræcum citratum, Thouars, Orch. Iles. Afr. t. 61 (1822) *Bot. Mag.* t. 5624. *Illus. hort. XXXIII*, t. 592 (1886). Williams' *Orch. Alb. VII.* t. 300. *Lindenia V.* t. 238. Ridley, in Journ. Linn. Soc. XXI. p. 481.

Although discovered in Madagascar by the French botanist, Du Petit Thouars,* the founder of the genus, towards the end of the last century and figured by him in the work quoted above, no further record or notice of it is to be found till 1865, in which year a plant whose origin we are now unable to trace, but which, we believe, was obtained from Mr. Ellis, flowered in our Chelsea Nursery, and was subsequently figured and described in the *Botanical Magazine*. At that time *Angræcum citratum* was exceedingly rare in British orchid collections, and continued to be so till the opening of the Suez Canal afforded facilities for the more rapid transmission of plants from Madagascar. *A. citratum* is abundant in the neighbourhood of Tamatava on the east coast, occurring on the margins of lakes and swamps, where it grows chiefly on small shrubs forming the undergrowth of the forest, often in dense shade, and always where the atmosphere is constantly saturated with moisture.

The specific name refers to the colour of the flowers (citron-coloured), but in the glass-houses of Europe the flowers are almost invariably French-white or very pale straw-yellow. The flowering season is from February to April.

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* The story of the life of Aubert du Petit Thouars is a very singular one, but too long for insertion here. The primary object of his visit to the Mascarene Islands was to search for the celebrated navigator La Perouse and his companions, at that time supposed to be lost; but owing to many accidents, on his arrival at the Isle of France (Mauritius) he found himself without friends and without resources; he accordingly applied to one of the rich planters in the island for employment, which he obtained, and for which his great botanical knowledge stood him in good need. He remained on the island ten years, occasionally making a voyage to Madagascar and other islands. He returned to Paris in 1802, but the results of his botanical labours in those distant lands were not published till 1822.

A. cryptodon.

Stems 1—3 inches high with three—four obovate-oblong leaves, 3 inches long. Racemes with a russet-brown rachis, pendulous, 8—10 inches long, few flowered. Flowers 1½ inch in diameter, on short reddish pedicels with all the segments first reflexed, then spreading; sepals and petals similar, linear-lanceolate, sub-acuminate, the sepals pale orange-red, the petals white; lip white, sub-cordate, apiculate; spur slender, 4—5 inches long, pale orange-red. Column white.

Angræcum cryptodon, Rchb. in Gard. Chron. XIX (1883), p. 307. Ridley in Journ. Linn. Soc. XXI. p. 482.

A neat dwarf species introduced by Messrs. Low and Co. from Madagascar in 1882, through their collector, Curnow. It is well distinguished horticulturally by its russet-brown peduncle and pale orange sepals and spur. The applicability of the specific name, literally "concealed tooth," is obscure.

A. eburneum.

Stems very robust, 2—4 or more feet high in the orchid houses of Europe, ligneous below, sheathed by the equitant bases of the leaves upwards. Leaves ascending, recurved towards the tips, ligulate, 18—24 inches long, 2 inches broad, very leathery, complicate towards the base, singularly oblique at the apex. Peduncles robust, ascending, as long again as the leaves, sheathed at each joint by a scale-like bract, racemose along the distal half, 9—12 or more flowered. Flowers sub-distichous and alternate, inverted, 3—4 inches in diameter; sepals and petals similar, spreading, lanceolate, acute, light green; lip broadly cordate, abruptly acuminate, ivory-white, concave, with a fleshy longitudinal crest at the base; spur 3 inches long, green. Column very short and thick, pale green.

Angræcum eburneum, Thouars, Orch. Iles. Afr. t. 65 (1822). Lindl. Gen. et Sp. Orch. p. 245 (1832). *Bot. Reg.* t. 1522. *Bot. Mag.* t. 4761. Williams' *Orch. Alb. I.* t. 41. Godefroy's *Orchidophile*, 1885, p. 168 (superbum). Ridley in Journ. Linn. Soc. XXI. p. 480. A. superbum, Thouars, Orch. Iles. Afr. t. 62. Lindl. Gen. et. Sp. Orch. p. 245. A. Brongniartianum, Linden's *Pesc.* t. 16.

var.—virens.

Flowers somewhat smaller, the disk of the lip stained with pale green.

A. eburneum virens, Hook. in *Bot. Mag.* t. 5170. A. virens, Lindl. in Bot. Reg. 1847, sub. t. 19. Id. in Paxt. Fl. Gard. I. p. 25, figs 9 and 10.

The origin of this remarkable orchid is thus stated by Dr. Lindley in the *Botanical Register* for 1832, sub. t. 1522:—"It is not uncommon in the island of Bourbon, growing upon trees, where it was found both by Colonel Bory de St. Vincent and by Du Petit Thouars. It was also met with at St. Mary's, Madagascar, by the unfortunate Forbes, by whom the only plant known to exist in Europe (1832) was sent to the Horticultural Society of London, in whose garden at Chiswick it flowered in November, 1831." *Angræcum eburneum* continued to be very rare in British gardens for a long time afterwards, the only record we find of it being the figure and description in the *Botanical Magazine* for 1854 of a plant that flowered in the Royal Gardens at Kew, and which had been derived from the collection of the Rev. John Clowes. It was subsequently sparingly imported both from Bourbon and Madagascar; the Madagascar plant differing from the Bourbon type in its somewhat more cordate labellum had received specific rank from the founder of the genus under the name of *A. superbum,* but this difference has since been found to be inconstant, and thence scarcely varietal. The variety *virens,* which seems to be a small state of the type, first appeared in Messrs. Loddiges' nursery in 1847, and again thirteen years later in the Royal Gardens at Kew; it is probably now lost to cultivation.

Angræcum eburneum offers a remarkable contrast to all the other cultivated Angræcums in the unusual dimensions attained by it even in the glass-houses of Europe; it is not only the Goliath of its own genus, but it is a giant among orchids, comparable in size and aspect with *Stauropsis lissochiloides (Vanda Batemanii).* Stately as is the aspect of the plant, especially when in flower, it takes up more house room than can be often conveniently assigned to it, which goes far to account for its comparative rarity in the orchid collections of Great Britain.

A. Ellisii.

Stems as thick as the little finger, 10 inches high in plant observed. Leaves narrowly oblong, 5—8 inches long and 1½—2 inches broad, emarginate or unequally bi-lobed at the apex, very leathery. Peduncles 18—21 inches long, first arching, then pendulous, racemed along the distal two-thirds, bearing 12—20 or more flowers on greenish pedicels springing from a small protuberance on the rachis and sheathed at the base by a small scaly brown bract. Flowers very pure white, the apical ones about 2½ inches in diameter, those towards and at the basal end of the raceme somewhat smaller; sepals and petals similar and sub-equal, elliptic-oblong, acute, the dorsal sepal inflexed at the apex, the petals and lateral sepals reflexed; lip nearly similar to the other segments, but broader, elliptic-oblong, acute; spur slender, 6—7 inches long, tinged with pale orange-red.

Angræcum Ellisii, Rchb. in Flora, 1872, p. 278. Gard. Chron. III. (1875), p. 277, icon. xyl. *Fl. Mag.* N.S. t. 191. Ridley in Journ. Linn. Soc. XXI. p. 483.

This very rare and curious Angræcum was discovered about the year 1854 by the Rev. W. Ellis, during his first missionary journey in Madagascar, and who brought home but three living plants, one of which shortly afterwards died: he sold the remaining two to the late Mr. B. S. Williams, of Holloway, one of which was acquired by Mr. John Day, in whose orchid collection at Tottenham it flowered for the first time in England. *Angræcum Ellisii* has since been sparingly imported, first by ourselves in 1879-80 through Curtis, who found it growing on the margins of lakes and swamps in partially exposed places in north-east Madagascar, and later by other firms. An importation of *A. articulatum* in 1881 was accidentally sold in one of the London auction rooms under the name of *A. Ellisii*, whence has arisen in some collections a confusion between the two species. *A. Ellisii* is a much larger plant than *A. articulatum*, with longer racemes of larger flowers, which, although structurally very near those of the last-named species, may be easily distinguished from them by their Gardenia-like fragrance and their much longer pale orange-red spur.

A. falcatum.

A diminutive plant. Stems 1—2 inches high, each with 3—5 somewhat falcately linear, acute leaves, 2—3 inches long, channelled on the face, sharply keeled beneath. Peduncles shorter than the leaves, 3—5 or more flowered. Flowers fragrant, milk-white, about ¾ inch in diameter, on slender pedicels 2 inches long; sepals and petals similar and equal, linear-oblong, acute; lip three-lobed, the side lobes minute, tooth-like, the intermediate lobe narrowly oblong, retuse; spur filiform, curved, as long as the pedicel.

Angræcum falcatum, Lindl. Gen. et Sp. Orch. p. 237, in note (1832), sub. *Œceoclades falcata.* Benth. in Journ. Linn. Soc. XVIII. p. 336 (1881). Limodorum falcatum, Swartz in Nov. Act. Up. VI. p. 79 (1799). *Bot. Reg.* t. 283 (1818). *Bot. Mag.* t. 2097. Œceoclades falcata, Lindl. Gen. & Sp. Orch. p. 237 (1832). Franch. et Sav. Enum. pl. Jap. II. p. 28. Aërides Thunbergii, Miq. Prod. p. 137. Sô Mokou, XVIII. fol. 24. Orchis falcata, Thunb. Fl. jap. p. 26.

The unpretending little orchid described above has an exceptional interest attached to it, not only from a scientific point of view on account of its geographical position and from the difficulty experienced by the older botanists in determining its systematic place, but also in a horticultural sense as being the first Angræcum cultivated in the glass-houses of Europe, and one of the earliest of the Japanese orchids ever introduced.

It was detected on the hills near the port of Nagasaki in southern Japan by Thunberg some time between 1773 and 1778.[*] So little was known at that time of the epiphytal orchids that Thunberg at first referred it to the terrestrial genus Orchis, with which it has but a slender affinity, but subsequently removed it to Limodorum, a monotypic genus widely dispersed over the Mediterranean region, to which it is scarcely more nearly related than to Orchis. In this, however, he was followed by his countryman Swarz, the greatest orchid authority of his time, and doubtless owing to the influence of this authority it was figured both in the *Botanical Register* (1818) and in the *Botanical Magazine* (1819) under the name of *Limodorum falcatum.* Lindley, was the first botanist to bring it under Angræcum, but afterwards removed it to Œceoclades, a genus which he had founded upon a Brazilian plant previously described and figured as an Angræcum,[†] but now somewhat doubtfully referred to Eulophia; the other species brought by Lindley under Œceoclades were removed by Reichenbach to Saccolabium with the exception of the little Japanese plant, our present subject, which he seems to have overlooked. This enlargement of Saccolabium was sanctioned by Bentham, who, however, rightly restores the Japanese plant to the genus in which Lindley first placed it.[‡] That a species of Angræcum should be found in a country so remote from its congeners as Japan, is a phenomenon for which no explanation can be offered.

Angræcum falcatum was first introduced into British gardens by Dr. Roxburgh, who sent plants to Sir Abraham Hume about the year 1813, and by whom they were cultivated in a hot-house in his garden at Wormley Bury, near Cheshunt. It probably became lost to cultivation for a number of years, till it was re-introduced by ourselves and other firms from its native country within the last quarter of a century. Besides the locality in which it was first detected by Thunberg, it has been reported from Kiu-siu and Kin-bo-san.

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[*] Carl Peter Thunberg was a Swedish physician and botanist, a pupil and one of the immediate successors of Linnæus in the Chair of Botany in the University of Upsal. In 1771 he obtained a situation as surgeon to one of the Dutch East India Company's vessels, and sailed from Amsterdam for the East. He landed at the Cape of Good Hope and made several excursions into the interior, and after having remained at the Cape three winters he sailed in 1773 for Java, and subsequently visited Japan. He returned to his native country in 1779, and published a *Flora japonica* in 1784.

[†] Bot. Reg. t. 618.

[‡] Gen. Plant. III. p. 579.

A. fastuosum.

A dwarf plant. Stems 1—2 inches high, with 3—5 oval-oblong spreading leaves, 2—3 inches long, with a depressed mid-line, emarginate or unequally bi-lobed at apex. Peduncles short, stoutish, pale green, 2—4 flowered. Flowers fragrant, 1½ inch in diameter, of the purest white; sepals and petals similar and sub-equal, narrowly elliptic-oblong, acute; lip broader than the other segments, obovate-oblong, obtuse, with a raised mid-line; spur slender, 3 inches long, that sometimes has a reddish tinge along the distal half.

Angræcum fastuosum, Rchb. in Gard. Chron. XVI. (1881), p. 748 and 844; XXIII. (1885), p. 533, icon. xyl.

One of the discoveries of the French naturalist and traveller, M. Léon Humblot, through whom it was introduced by Messrs. Sander and Co. in 1881, but, it would seem, in very limited numbers, the only plant known to us in cultivation for some years afterwards being in the collection of Sir Trevor Lawrence, Bart., at Burford Lodge, by whom it was exhibited at the Royal Horticultural Society's meeting on April 22nd, 1884, presumably the first occasion of its flowering in England. A recent importation has caused it to become better known. Like the species last described it is a diminutive plant, but totally different in aspect, both in its foliage and flowers; the purity and fragrance of the latter render the species one of the most admired in the genus.

A. fragrans.*

"Stems 6—10 or more inches high, as thick as a goose-quill. Leaves few, towards the top of the stem, lorate, 3—4 inches long, ½—¾ inch broad, deeply two-lobed at the tip. Peduncles ascending, 2—2½ inches long including ovary. Flowers solitary, 2 inches in diameter, white, fragrant; sepals and petals linear, spreading and recurved; lip as long as the sepals, hastately lanceolate, grooved down the centre; spur slender, longer than the sepals, green. Column very short."—*Botanical Magazine.*

Angræcum fragrans, Thouars, Orch. Iles. Afr. t. 54 (1822). Lindl. Gen. et Sp. Orch. p. 246 (1832). *Bot. Mag.* t. 7161. Aërobium fragrans, Spreng. Syst. veg. III. p. 716 (1826). Aëranthus fragrans, Rchb. in Walp. Ann. VI. p. 899 (1864).

A species that has been known to science from the early part of the present century, and at present in cultivation in the Royal Gardens at Kew, whither it was sent by Mr. Horne, Director of the Botanic Garden at Pamplemousse, near Port Louis in Mauritius, of which island it is a native, and also of the neighbouring island of Bourbon.

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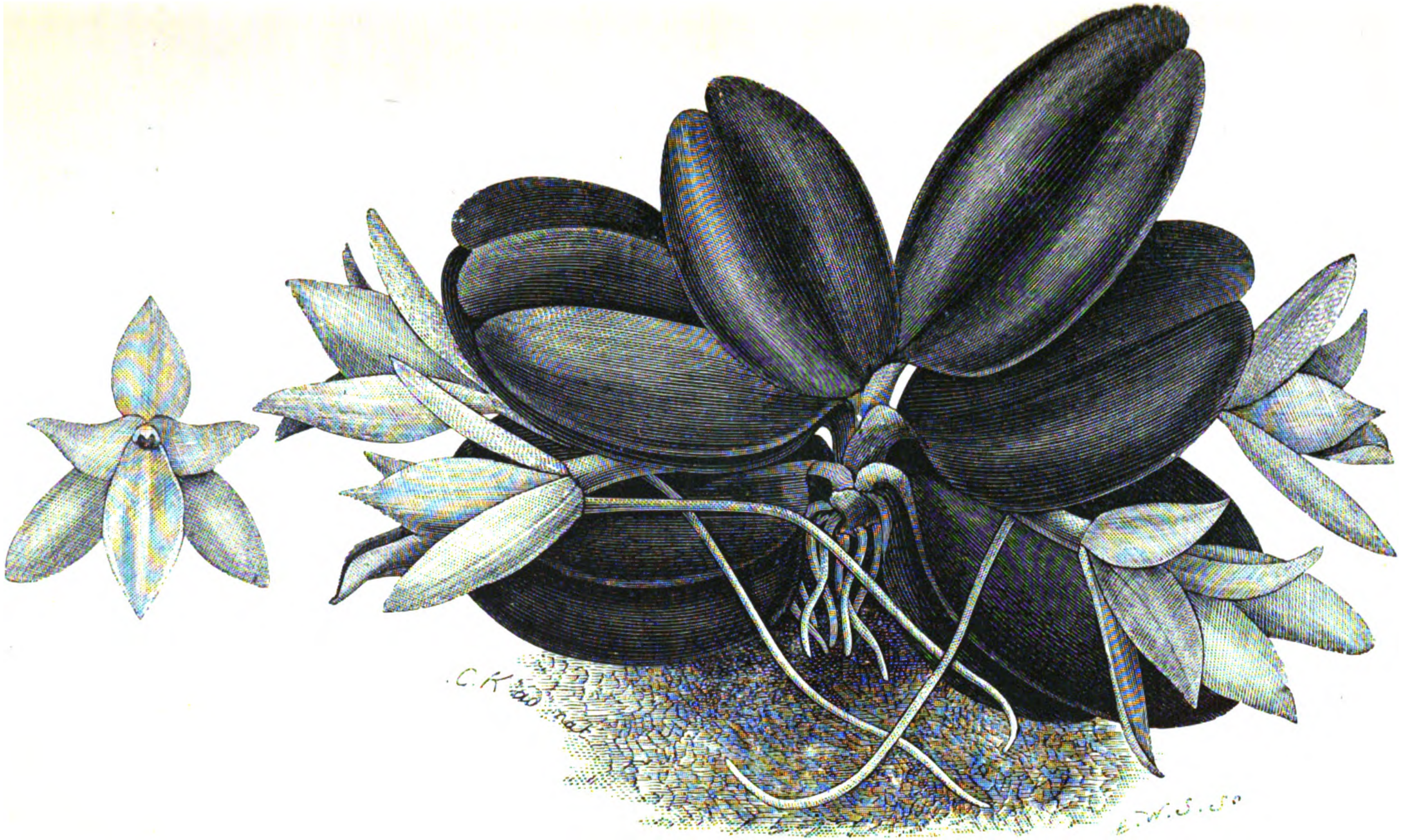
* Not seen by us.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Angræcum fastuosum.

(From the *Gardeners' Chronicle.*)

The chief interest attached to the plant will be gathered from the following extract:—

> "The leaves of *Angræcum fragrans* are imported from Mauritius, and in a dry state have an odour which much resembles vanilla; it is sufficient to touch the fresh leaves for the fingers to remain impregnated with their aroma. In Mauritius, and even in France, a very agreeable tea is prepared from the leaves, which is used as a digestive, and even recommended in diseases of the respiratory organs. Mixed with ordinary tea they impart to it an extremely agreeable perfume." *

A. fuscatum.

Stem short, not exceeding a few inches high in the cultivated plants. Leaves oblong-cuneate, 4—5 inches long, obtuse or unequally bi-lobed at the apex. Racemes flaccid and sub-pendulous, longer than the leaves, many flowered, the rachis russet-brown tinged with green, the pedicels springing from a cushion-like out-growth as in *Angræcum Ellisii*, and sheathed at the base by a small triangular bract. Flowers 1—1½ inches in diameter, cream-white; sepals and petals similar and sub-equal, lanceolate, acute; lip broader than the other segments, oblong to beyond the middle, and then somewhat suddenly acuminate; spur slender, about three times as long as the stalked ovaries.

Angræcum fuscatum, Rchb. in Gard. Chron. XVIII. (1882), p. 488. Regel's *Gartenflora*, 1886, p. 589, t. 1234. Rev. hort. 1887, p. 235, fig. 49.

Introduced by Messrs. Low and Co., from Madagascar, in or before 1882, in the autumn of which year it flowered in several collections, both British and continental. It is very near *Angræcum Ellisii*, from which it can scarcely be distinguished except by its smaller size, its more flaccid and brownish peduncles, and its smaller flowers, with a much shorter and more slender spur; it also approaches very closely *A. articulatum*, but is a little "larger in all its parts." More definite characters are wanting to distinguish it specifically from either species, between which it is intermediate.

A. Germinyanum.

Stem slender, scandent, 12—18 inches high under cultivation, leafy along the upper part. Leaves linear-oblong, 2—3 inches long, sessile, unequally bi-lobed at apex. Flowers solitary, on slender green pedicels produced from opposite a leaf about half-way up the stem, pure white; sepals linear, 2½—3 inches long, from a narrowly lanceolate base; petals similar, but shorter and more slender; lip quadrate with rounded angles, shell-like, suddenly contracted in the middle into a filiform, reflexed tail, an inch long; spur slender, 3 inches long, greenish white. Column very short.

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* M. Gobley in *Chemical Gazette* ex Gard. Chron. 1850, p. 599.

Angræcum Germinyanum, Hook. f. in *Bot. Mag.* t. 7061.

A very remarkable species, "discovered in 1886 in the interior of Madagascar, in the same forests with *Phaius tuberculosus* and *P. Humblotii*," by M. Leon Humblot, the French naturalist and traveller, by whom it was sent to Messrs. Sander and Co.; a very few plants reached this country alive, so that it is still quite rare in cultivation. It flowered for the first time in England in the Royal Gardens at Kew, in May, 1888, and is dedicated to Comte Adrien de Germiny, of Gouville, near Rouen, one of the most munificent patrons of horticulture in France. The long attenuated perianth segments of this species easily distinguish it from every other cultivated Angræcum.

A. hyaloides.

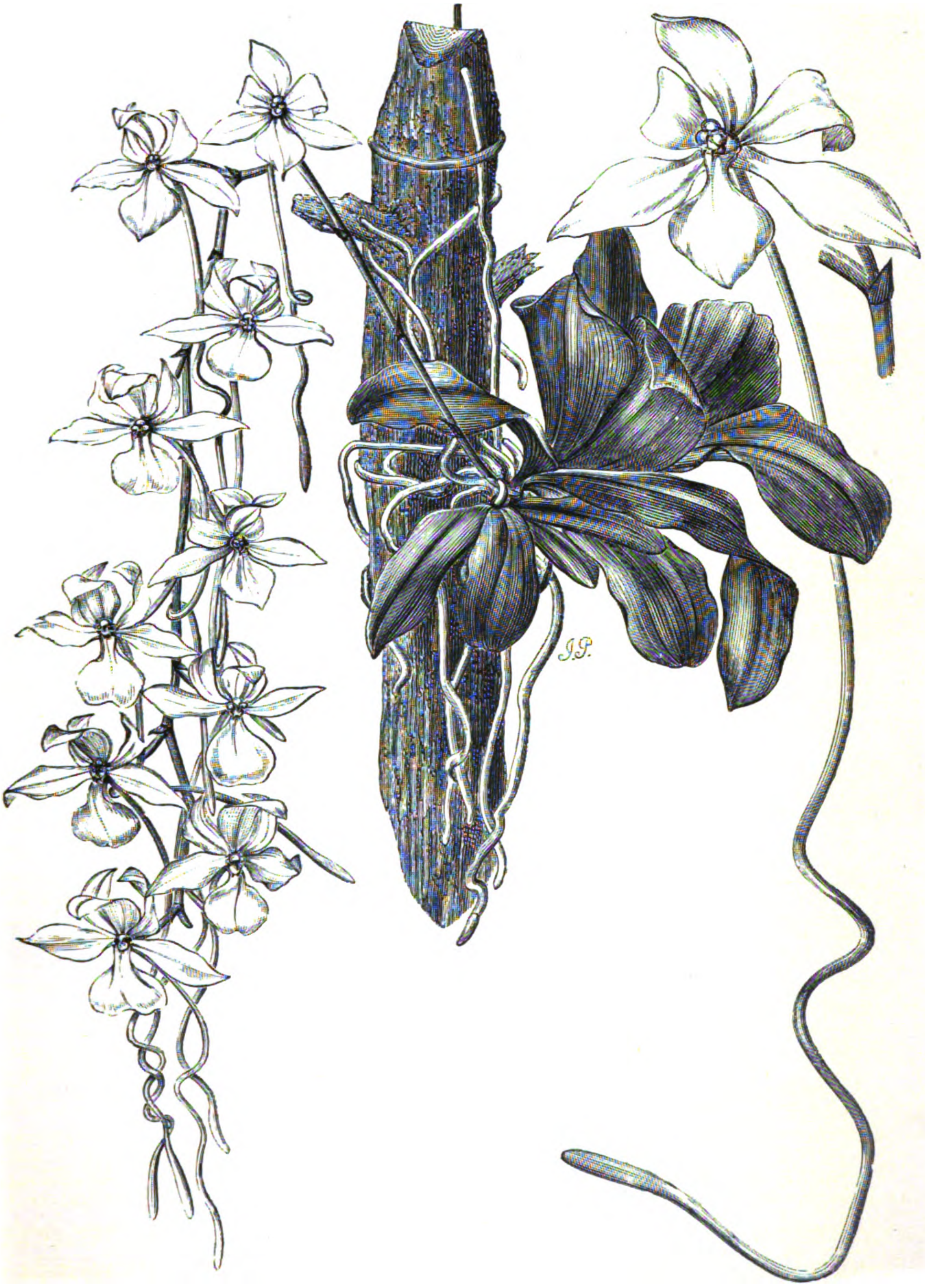
A diminutive plant. Stems scarcely exceeding an inch in height with 5—7 oval-oblong spreading leaves, obtuse or unequally two-lobed at the apex. Racemes a little longer than the leaves, 10—15 flowered. Flowers small, distichous and alternate, transparent white, on short, white pedicels; sepals, petals, and lip similar and sub-equal, oval-oblong, acute, the sepals the narrowest; spur slender, as long as the pedicel.

Angræcum hyaloides, Rchb. in Gard. Chron. XIII. (1880), p. 186. Godefroy's *Orchidophile*, 1889, p. 347.

The most admired of the minute Angræcums and invariably characterised in the horticultural press as "a little gem." It was introduced by us in 1879 through Curtis, who discovered it in north-east Madagascar growing on small shrubs forming the undergrowth of the dense forest along the low, swampy coast, always in shade. The flowers are produced in great profusion for the size of the plant, and are of a delicate, semi-transparent texture, which suggested the specific name (from ὕαλος, crystal).

A. Kotschyi.

Stem short, emitting stoutish, flexuose, grey-brown roots that are sometimes 20—30 inches long. Leaves few but variable in size and shape, the largest obovate-oblong, 5—7 inches long, unequally bi-lobed at the apex and very leathery, the smaller ones narrowly oblong, 3—4 inches long, sub-acute or emarginate. Racemes quite pendulous, 7—10 or more flowered. Flowers white, 1½ inch in diameter, on pale red-brown pedicels 1½ inch long; the dorsal sepal and petals ovate-oblong,



Angræcum Kotschyi.

acute, reflexed; the lateral sepals longer and narrower, lanceolate, acute, spreading; lip with a broad claw and sub-rhomboidal, apiculate blade; spur very long for the size of the flower, slender, twisted, 8—9 inches long, pale red-brown.

Angræcum Kotschyi, Rchb. in Gard. Chron. XIV. (1880), pp. 456 and 693, icon. xyl. Id. XXII. (1884), p. 712. Williams' *Orch. Alb. IV.* t. 179.

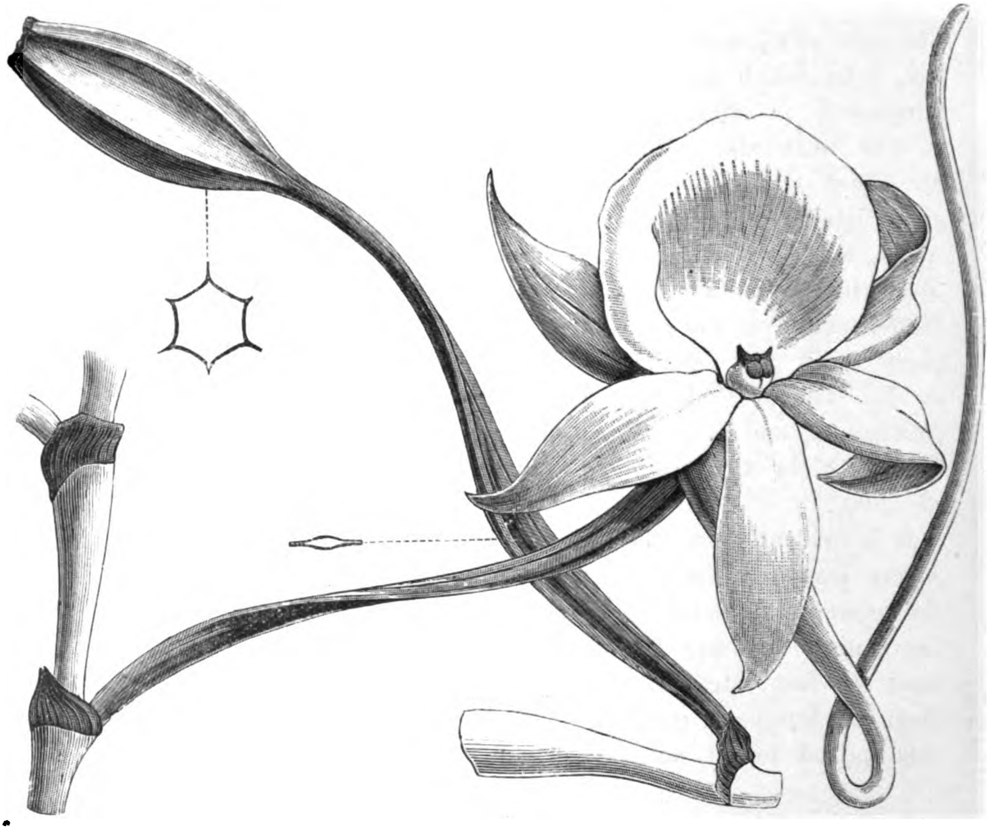
The botanical history of this curious Angræcum was sketched by the late Professor Reichenbach in the *Gardeners' Chronicle,* loc. cit., from which we extract the following particulars:—It was first discovered in 1838 by Theodor Kotschy, who gave no locality; it was next met with by C. J. Meller in 1860, in the valley of the Shiré river, not far from its junction with the Zambesi. Two years later it was gathered by Captain Grant in the region of the upper Nile, whose specimen (imperfect) is preserved in the Kew Herbarium. In 1876 it was found by the German botanical traveller, Hildebrandt, on the coast of Zanzibar, and three years later living plants were sent by Sir John Kirk, the British Consul at Zanzibar, to Mr. Gerald Walker, who had previously introduced *Angræcum Scottianum,* and from whom we acquired them. It flowered for the first time in this country in our Chelsea Nursery in the autumn of 1880.

It is evident from the above sketch that *Angræcum Kotschyi* is widely dispersed over eastern Africa, occurring in Zanzibar and in the countries administered both by the East and South African Companies. Although we are not aware of its having been imported since its first introduction, and is now, in consequence, a very rare plant in European gardens, its re-introduction may be very reasonably looked for at no very distant date.

A. Leonis.

Stem as thick as the little finger, a few inches high in the imported plants, ligneous below, the upper part concealed by the bases of the equitant leaves. Leaves fleshy, ensiform, falcate, 5—10 inches long, the blade vertical from the cohesion of the halves at their upper surface on either side of the mid-nerve. Peduncles stoutish, erect, or sub-erect, racemose, 3—7 or more flowered. Flowers white, 2—3 inches in diameter, on compressed, ancipitous, narrowly winged pedicels 3 inches long, including the short six-ribbed ovary; sepals and petals lanceolate, acuminate, recurved, keeled behind, the petals a little shorter and broader than the sepals; lip cordate, cuspidate, concave, produced at the base into a flexuose spur 5—6 inches long, funnel-shaped and compressed at its upper part, and with a short elevated plate at its aperture, the dilated half white, the distal slender half green. Column very short, the rostellum produced in front into two rounded plates.

Angræcum Leonis, supra. Aëranthus Leonis, Rchb. in Gard. Chron. XXIII. (1885), p. 726; XXIV. p. 80, icon. xyl. Williams' *Orch. Alb. V.* t. 213.



Angræcum Leonis.

(From the *Gardeners' Chronicle.*)

Discovered by M. Leon Humblot in the Comoro islands, and introduced by him into European gardens in 1885. It is a remarkable addition to the genus, and in a horticultural sense one of the most useful of Angræcums on account of the freedom with which its chaste blossoms are produced. Botanically it is a very interesting plant; its leaves are equitant, that is to say, the upper surfaces on each side of the mid-nerve cohere to each other, except at the base,* like the leaves of some species of Iris, and the blade is thence brought into a vertical position and imparts a habit to the plant that is peculiar to the species so far as our present knowledge of the genus extends. The ancipitous winged pedicels, the funnel-like upper part of the spur of the labellum, the cleft rostellum and the double caudicles of the pollinia are also noteworthy characters, the last two indicating a near affinity with *A. sesquipedale.*

We are unable to follow Reichenbach in referring *Angræcum Leonis* and *A. sesquipedale* to Lindley's genus Aëranthus, of which the only genuine species known are *A. grandiflorum*, the type, and *A. Arachnitis* (*Dendrobium Arachnitis* of Thouars). The first is figured in the *Botanical Register*, t. 817, and the second in the *Botanical Magazine,* t. 6034 (wrongly spelt Acranthus). Both are natives of Madagascar, and have been in cultivation but are now probably lost, as neither of them are sufficiently attractive to secure the favour of amateurs. A reference to the figures we have quoted will show at a glance that these plants differ notably from Angræcum in habit, in the form of the flower, and especially in the spur of the labellum, which is more that of an Aërides than an Angræcum.

A. modestum.

Stems short, as thick as an ordinary writing-pencil, emitting numerous slender, branched, aërial roots. Leaves narrowly oblong, or narrowly obovate-oblong, 4—6 inches long, sub-acute or obliquely emarginate. Peduncles descending, 10—15 or more inches long, brownish green with numerous joints along the basal part, at each of which is a small, obtuse, closely appressed bract, and a similar one at the base of each pedicel. Flowers pure white, about an inch across vertically, on short, pale, orange-red pedicels; sepals lanceolate; petals broader, ovate-lanceolate acute; lip broadly ovate, apiculate; spur slender, 2½—3 inches long, white. Column very short.

Angræcum modestum, Hook. f. in *Bot. Mag.* t. 6693 (1883). Gard. Chron. III. s. 3. (1888), p. 428. A. Ellisii, *Lindenia II.* (1886), t. 92. A. Sanderianum, Rchb. in Gard. Chron. III. s. 3 (1888), p. 168. *Rev. hort.* 1888, p. 516. *Rev. hort. Belge*, 1889, p. 217.

The plant figured in the *Botanical Magazine* under the above name was presented by the Dowager Lady Ashburton to the Royal Gardens at Kew, where it flowered in April, 1883, and this was probably the first time of its flowering in this country. Five years later the species was imported from Madagascar by Messrs. Low and Co., and about the same time Messrs. Sander and Co. received a consignment of plants of an Angræcum collected in the Comoro islands by M. Leon Humblot which received the name of *Angræcum Sanderianum* from the late Professor Reichenbach. Plants of both importations subsequently flowered in our houses contemporaneously and thence afforded an opportunity for comparison, with this result, that structurally the flowers of the Madagascar and Comoro plants are identical, but the leaves of the latter are broader, and the racemes longer than those of the former. We have therefore reduced the second name to a synonym of the first, the slight differences observable in the vegetative organs being scarcely of even varietal value.

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* The leaves of *Angræcum eburneum*, *A. sesquipedale*, and *A. pertusum* show a tendency to the same peculiarity.

A. pellucidum.

Stems very short. Leaves few, narrowly oblong, 10—12 inches long and 2 inches broad, recurved, imbricating at the base, obliquely two-lobed at the apex. Racemes pendulous, longer than the leaves, many flowered. Flowers of semi-transparent texture, close-set, spirally arranged round the rachis, on very short pedicels, yellowish white; sepals and petals similar and sub-equal, linear-lanceolate; lip cordate-ovate, truncate at the apex, and fimbriate at the margin; spur short for the genus, not longer than the lip and bent under it.

Angræcum pellucidum, Lindl. in *Bot. Reg.* 1844, t. 2. Listrostachys pellucida, Rchb. in Walp. Ann. VI. p. 907 (1864).

Dr. Lindley remarked of this orchid that "its flowers are as delicate and transparent as if they were flakes of snow fixed by frost in the very act of melting; each part of the lip is studded and bordered with little crystalline elevations, and the whole fabric of the blossom is as fragile as thin plates of glass." There is doubtless a little hyperbole in this encomium, nevertheless the flowers of *Angræcum pellucidum* are very peculiar in texture, shape and colour. It was introduced from Sierra Leone by Messrs. Loddiges in 1842, but it is now rarely seen in British gardens. Our description was taken from a plant in the collection of Sir Trevor Lawrence, Bart., at Burford Lodge. The double caudicle of the pollinia places the species in the section LISTROSTACHYS of Bentham.

A. pertusum.

Stem 6—12 inches high, as thick as the little finger. Leaves narrowly strap-shaped, 6—8 inches long, sheathing at the base, unequally and obliquely two-lobed at the apex. Peduncles nearly as long as the leaves, arching, racemose from near the base. Flowers scarcely exceeding half-an-inch in diameter, white, close-set and symmetrically arranged (secund) along the upper side of the rachis; sepals broadly ovate, concave; petals similar but smaller; lip obovate-spathulate; concave above; spur slender, decurved, greenish, a little longer than the blade.

Angræcum pertusum, Lindl. in Paxt. Mag. Bot. VII. p. 237 (1840). *Bot. Mag.* t. 4782. A. Pescatoreanum, Lindl. in Jour. Hort. Soc. IV. p. 263 (1849). Listrostachys pertusa, Rchb. in Walp. Ann. VI. p. 908 (1864).

Angræcum pertusum was first cultivated by Messrs. Loddiges, in whose nursery at Hackney it flowered in 1840, but who left no record of its origin. Nine years later a plant, which had been received from the Isle of Bourbon, flowered in the collection of M. Pescatore, at St. Cloud, Paris, but on materials being sent to Dr. Lindley for naming he failed to identify it with Messrs. Loddiges' plant, and named it *A. Pescatoreanum,* which Reichenbach afterwards reduced to a synonym of *A. pertusum* (*Listrostachys pertusa*). The Isle of Bourbon is its only known station.

The extreme formality of the inflorescence has acquired for this orchid among gardeners the name of the "fish-bone Angræcum," from its fancied resemblance to the spine of a small fish.

A. Scottianum.

Stems cylindric, as thick as a goose-quill, 12—20 or more inches high, green and leafy along the upper third, clothed with brown sheaths below. Leaves terete, 3—4 inches long, deeply grooved on the upper side, spreading and recurved. Peduncles slender, as long as the leaves, one—two flowered. Flowers inverted, 1½—2 inches in diameter; sepals and petals similar, linear, acute, pale straw-yellow changing to white, the petals a little the narrowest; lip transversely oblong, concave and pure white above, with a mucro on the anterior edge, and prolonged at the base into a pale reddish brown slender spur 4—5 inches long. Column very short, with two small hatchet-shaped wings in front.

Angræcum Scottianum, Rchb. in Gard. Chron. X. (1878), p. 556. Id. Xen. Orch. III. p. 75, t. 239, fig. 2. Gard. Chron. XIV. (1880), p. 136, icon. xyl. *Fl. Mag.* n.s. t. 421. *Bot. Mag.* t. 6723. Godefroy's *Orchidophile*, 1886, p. 387.

First obtained by Sir John Kirk in 1878 from Johanna, one of the Comoro islands, and sent by him to Mr. Gerald Walker, from whom we acquired the few plants that survived the voyage; it was also sent about the same time to the Royal Gardens at Kew. The species is dedicated to Mr. R. Scott, of Cleveland, Walthamstow, in whose garden it flowered for the first time in this country in 1879; it flowered shortly afterwards in our Chelsea Nursery, and in the following year at Kew. An importation in 1885 through M. Leon

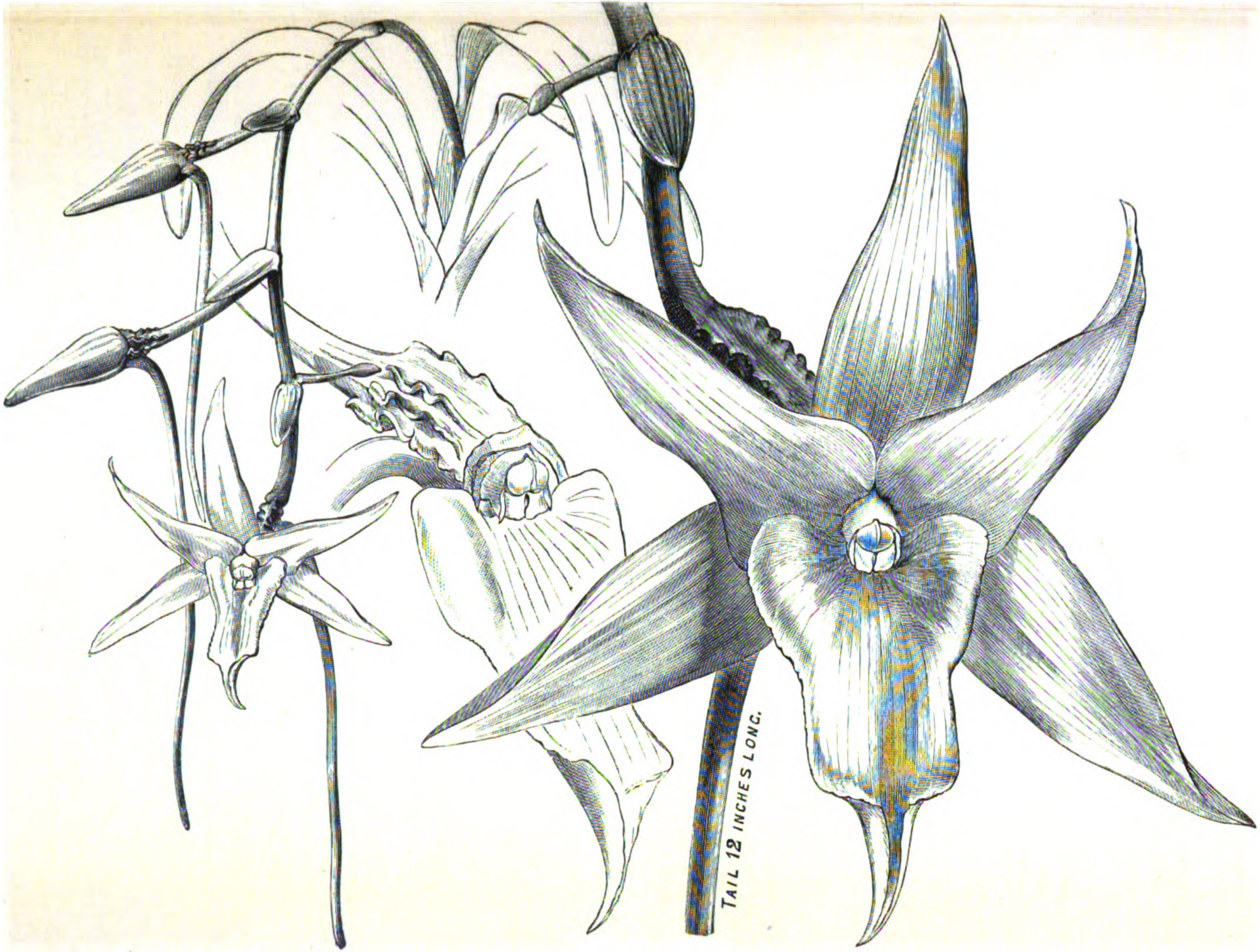
Humblot has caused the plant to become generally distributed among the orchid collections of Europe, where it is readily distinguished from all other Angræcums by its slender stem of semi-scandent habit, its terete leaves, and its large, almost square lip.

A. sesquipedale.

Stem as thick as the little finger, rarely exceeding 2—3 feet high under cultivation, ligneous below, closely sheathed by the imbricating bases of the leaves upwards. Leaves ligulate-oblong, wavy, about a foot long and 1½—2 inches broad, complicate and sheathing at the base, unequally two-lobed at the apex, deep green. Peduncles as long as the leaves, 2—4 flowered; bracts ovate, acute, keeled, brownish, much shorter than the stalked, three-furrowed ovary. Flowers the largest in the genus, 5—7 inches in diameter, somewhat fleshy, ivory-white; sepals and petals similar, broad at the base and gradually acuminated, the petals contracted near the base and narrower than the sepals; lip broader than the other segments, cordate at the base, then oblong and irregularly serrated, and terminating in a reflexed acuminate tip; spur greenish, nearly a foot long, flexuose towards the tip. Column very short and thick, the rostellum produced into two sub-quadrate lobes that almost conceal the stigma.

Angræcum sesquipedale, Thouars, Orch. Iles. Afr. tt. 66-67 (1822). Lindl. in Gard. Chron. 1857, p. 253: XII. (1879), p. 305, icon. xyl. *Bot. Mag.* t. 5113. Van Houtte's *Fl. des Serres, XIV.* t. 1413. Warner's *Sel. Orch. I.* t. 31. *Illus. hort. XIII.* t. 475. Regel's *Gartenfl.* 1872, t. 744. Jennings' *Orch.* t. 3. *Lindenia, IV.* t. 175. Ridley in Journ. Linn. Soc. XXI. p. 475. Aëranthus sesquipedalis, Lindl. Gen. et. Sp. Orch. p. 244 (1833). Sander's *Reichenbachia, I.* t. 14.

This, the *facile princeps* of Angræcums, was discovered towards the end of the last century by the French botanist, Du Petit Thouars, the founder of the genus, but it did not become generally known to science till after the publication, in 1822, of his history of the plants found in Madagascar. It was quite natural that both botanists and horticulturists should long to see so remarkable a plant in the glass-houses of Europe, but owing to the circumstances of the times, a period of thirty-three years elapsed before the wish was realised. To the Rev. W. Ellis, the missionary and historian of Madagascar, is due the merit of first introducing it. In 1855 he succeeded in bringing home, with plants of other species of Angræcum, three living plants of *Angræcum sesquipedale*, one of which flowered in his garden at Hoddesden, Herts, in the spring of 1857. It continued to be very rare in cultivation for many years afterwards, the many attempts made to re-introduce it meeting with but partial success in consequence of the length of time occupied in


TAIL 12 INCHES LONG.

Angræcum sesquipedale.

transmission. Since the opening of the Suez Canal, *A. sesquipedale* has been imported by ourselves and other firms, so that there is now scarcely an orchid collection of note, either in Great Britain or on the Continent, in which it is not represented by one or more specimens.

The account given by Mr. Ellis to Dr. Lindley of the conditions under which this orchid grows in Madagascar, and published in the *Gardeners' Chronicle* for 1857, has been transcribed almost as often as the plant has been figured. This account is, however, the best if not the only one known to us, and this must be our excuse for reproducing it here in an abridged form :—

> "It occurs in the lowest and hottest districts, generally on straggling trees along the edge of the forest, or in parts where the trees are only thinly spread over the country. It grows most frequently on the driest parts of the trunks and branches of thinly leaved trees, and occasionally near the ground. It grows most abundantly where there is plenty of light and air. The leaves are neither numerous nor large, and in its wild state the plant most frequently presents a starved appearance and straggling habit. The roots are few in number, frequently running down the tree on which it grows 12 to 18 feet,* and so tough and adhering so tenaciously to the bark that a considerable force is required to break or detach them."

Du Petit Thouars called the species *sesquipedale*, "a foot and a half," in reference to the length of the flowers from the tip of the dorsal sepal to the end of the spur. The name doubtless implies a slight exaggeration. We know of no instance of which the spur has exceeded a foot in length.

> This spur performs the office of a nectary for the secretion of honey. The late Mr. Charles Darwin thence asked, "What can be the use of a nectary of such disproportional length? We shall, I think, see (he continues) that the fertilisation of the plant depends on this length, and on the nectar being contained only within the lower and attenuated extremity. It is, however, surprising that any insect should be able to reach the nectar. Our English sphinxes have probosces as long as their bodies, but in Madagascar there must be moths with probosces capable of extension to a length of 10 or 11 inches." He then proceeds to describe the sexual apparatus of the Angræcum, and the contrivances he employed to effect the removal of the pollinia in the same way that an insect would withdraw them with its proboscis. The inference he draws from his experiments is perfectly logical, and may be best expressed in

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* See Aërides, pp. 61, 62.

his own words. "If the Angræcum in its native forests secretes more nectar than the vigorous plants in our hothouses, so that the nectary becomes filled, small moths might obtain their share, but they would not benefit the plant. The pollinia would not be withdrawn till some huge moth with a wonderful long proboscis tried to drain the last drop. If such great moths were to become extinct in Madagascar, assuredly the Angræcum would become extinct also. On the other hand, as the nectar, at least in the lower part of the nectary (spur) is stored safe from depredation by other insects, the extinction of the Angræcum would probably be a serious loss to those moths."*

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The names in italics are varieties or synonyms; those followed by × are hybrids.

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* *Fertilisation of Orchids*, pp. 197—262.

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This work received the award of a Diploma at the International Forestry Exhibition at Edinburgh, 1884, and a *Medaille de Vermeil* at the Quinquennial International Exhibition at Ghent in April, 1888.

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MANUAL
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PART IV.

CYPRIPEDIUM.

JAMES VEITCH & SONS,
Royal Exotic Nursery, 544, King's Road, Chelsea, S.W.

1889.

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PRELIMINARY NOTICE.

THIS Manual is being compiled to supply amateurs and cultivators of exotic Orchids with a fuller account of the principal genera, species and varieties cultivated under glass, than is contained in the Manuals hitherto in use.

The rapid extension of Orchid culture during the last quarter of a century, resulting from the increased taste for and appreciation of this beautiful and interesting order of plants, has, in our opinion, created the *desideratum* which we are now attempting to supply. The prominent place, too, occupied by Orchids in the columns of the Horticultural Press, and the surprising amount of practical and varied information respecting them disseminated through its agency, has also stimulated the desire to obtain all the leading facts in a condensed form, to which easy reference may at any time be made.

So numerous are the species and varieties of Orchids at present in cultivation, and to which additions are constantly being made by new discoveries and by artificial hybridisation, that the labour attending the compilation of a Manual sufficiently comprehensive to meet the wants of cultivators must necessarily demand much time. Moreover, the present unsatisfactory state of Orchidology, especially in its horticultural aspect and its complicated and unscientific nomenclature, have rendered the compilation of such a Manual within a stated time almost an impossibility.

Under these circumstances, and yielding to the solicitations of patrons and friends, we have decided upon issuing the work in parts, each part containing a monograph of the cultivated species and varieties of one of the most important genera, or of a group of genera.

Little explanation of the plan of the work is here needed; the parts as issued must speak for themselves. We have only to state that in the scientific classification and sequence of the genera we have followed, with but trifling deviations, the arrangement of Bentham and Hooker as elaborated in their *Genera Plantarum,* the most profound and, at the same time, the most intelligible exposition of the Orchideæ extant. In the nomenclature of the species, we have adhered to the Laws of Botanical nomenclature adopted by the International Botanical Congress, held at Paris in August, 1867.

In the description of the species, we have been compelled to use occasionally a few technical terms to avoid cumbrous circumlocutions; at the conclusion of the work we propose giving a glossary of the terms so used. In the cultural notes we have quoted temperatures in the Centigrade scale with the equivalent Fahrenheit readings, in the hope that the far more rational scale, now almost universally adopted in scientific investigations, may also come into use in horticulture. The literary references in italics indicate coloured plates of the species or variety described.

TRIBE—CYPRIPEDIEÆ.

CYPRIPEDIUM.

Linn. Gen. p. 272, No. 687 (1737). Id. Gen. ed. VI. p. 464, No. 1015 (1764). Lindl. Gen. et Sp. Orch. p. 525 (1840). Benth. et Hook. Gen. Plant. III. p. 634 (1883).

The genera, with their contained species and varieties, hitherto described in this work, follow each other, in the great majority of cases, by gradations so small, or are so closely connected by other genera, necessarily omitted on account of their included species possessing no qualities recommending them to the attention of the cultivator, that the systematic botanist not infrequently experiences considerable difficulty in pointing out the characters by which they may be best distinguished from each other; and even the tribes and sub-tribes are not always separated by an easily discernible frontier line. Not so, however, with the CYPRIPEDIEÆ, for here the transition is so abrupt and so striking that the singular divergence in structure exhibited by the flowers of this tribe from those of all the others, is as perplexing to account for as it is difficult to find limiting characters in many of the genera of the other tribes.

A comparison of the flower of Cypripedium with that of any genus belonging to another tribe, shows that it differs from it structurally far more than any two flowers of other tribes—even if selected from genera included in different tribes—differ from each other, so that "an enormous amount of extinction must have swept away a multitude of intermediate forms, and left this single genus as a record of a former and more simple state of the great Orchidean Order."*

Nor does the structure of the flowers furnish the only evidence of the Cypripedes being a more primitive race of orchids than any other existing forms. The geographical distribution of the genus, especially of the two sections of it that form the subject of these pages, reveals some remarkable facts respecting the present history of the included

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* Darwin, *Fertilisation of Orchids*, p. 271. Aspasia and Neuwiedia, the former with two and the latter with three perfect anthers, and the labellum in both genera similar to the sepals and petals, were probably either unknown to Darwin or were overlooked by him when writing the passage quoted. The statement in the text is not, however, in the least affected thereby.

B

species, all of which tend to the conclusion that the individual plants comprising them must, at one time, have existed in greater numbers, and have been spread over a much larger area than they at present occupy in a wild state, and that a gradual process of extinction has been as surely in operation here as it has been with more primitive types in other Natural Orders that are now become only subjects for the study of the geological botanist, although, of course, the epoch of final extinction may yet be far remote, and the race may be preserved indefinitely by the hand of Man. Paradoxical as this may appear to the horticulturist habituated to regard the Cypripedes as being among the easiest of orchids to propagate, the following considerations will go far to show that the statement here offered rests upon a good foundation. Although the Cypripedes are still spread over large portions of the earth's surface both in the eastern and in the western hemisphere, the included species have, almost without exception, retreated to stations that are extremely restricted in area, and frequently isolated and remote from each other; that while some species are still found to be abundant in their known habitats, and have been and are still being imported into Europe in quantity, it is very different with other species; for example—the habitat of the beautiful *Cypripedium Fairieanum* is practically unknown, and all the existing plants in cultivation have been derived from the three or four that were first casually imported. Two plants only of *C. superbiens* that appeared accidentally among importations of *C. barbatum* are believed to be the progenitors of all at present known, and it is quite uncertain whether the species still exists in a wild state. *C. Mastersianum* has been but once imported, and its habitat is unknown to science. *C. tonsum* was sent to us in company with *C. Curtisii* unknown to its discoverer, who informs us that the last-named is quite rare, while its near ally *C. ciliolare*, although somewhat more plentiful, has retreated to a remote corner of the Philippine Islands. *C. purpuratum* has become almost extinct as a wild plant in Hongkong, and it is fast disappearing before the pressure of population on the Chinese mainland. The Cypripedes of South America present a similar phase in their history. *C. Boissierianum*, one of the first species discovered on that continent, has been found only in a sequestered valley high up on the Andes of Peru, while thousands of miles distant from that lonely spot, on the Roraima Mountain in British Guiana, *C. Lindleyanum* and *C. Klotzschianum* have their home; and still further remote from either, on the Organ Mountains of southern Brazil, *C. vittatum* occurs and nowhere else. Nor are there instances wanting among the hardy Cypripedes to prove that the same process of extinction is also in operation. Our native *C. Calceolus* has become virtually extinct in this country as a wild plant, although, owing to its extensive distribution over central Europe, it is still comparatively abundant in some spots, while in others it is visibly yielding ground to the pressure of cultivation and the presence of a dense population; and this is also true of all the Japanese and of several of the North American species.

The true cause of the gradual extinction of the race is probably to be sought for in the reproductive organs of the flowers. A very cursory examination of these must satisfy most observers that self-fertilisation is impossible,* and the sexual apparatus is so constructed that few among existing races of insects are found capable of effecting the necessary act of fertilisation that secures the perpetuation of the plant by seeds.† Dr. Hermann Müller, one of the most patient and accurate observers of the fertilisation of flowers by insect agency, has enumerated but five species of *Andrena* (Bees) that he detected fertilising the flowers of *Cypripedium Calceolus*, and which, "attracted by the perfume of the flowers, fly into the slipper-shaped lip, and lick and bite the hairs lining its floor, which are sometimes covered with small drops of honey."‡ Now the flowers of tropical Cypripedes are absolutely devoid of perfume, and although the inner surface of their labellum is studded with short bristly hairs, as in *C. Calceolus*, we have never, after repeated trials, been able to detect any secretion from them or from any other part of the pouch that possesses any trace of sweetness to the taste, like the honey exuded from the base of the column and ovary of other tropical orchids, as Cattleya, Dendrobium, Odontoglossum, etc.; hence we are tempted to believe that the tropical Cypripedes, like some of our native orchids, must be reckoned among C. C. Sprengel's category of *Scheinsaftblumen* (Sham-nectar-producers). The labellum, in fact, acts rather like a trap than a bait, for when insects of any size, as bees, that have entered by the aperture in front of the staminode endeavour to make their exit through the lateral openings, they are liable to be held fast by the sticky pollen till they perish miserably; indeed, Müller observed that even "smaller bees and flies that are too large to pass freely through the lateral orifices and too weak to force their sides apart, must, as a rule, perish of hunger within the labellum." That the tropical Cypripedes are similarly circumstanced in their relation to insect visits is in the highest degree probable, for direct observations are, unfortunately, altogether wanting; and the probability is strengthened by the fact that among the thousands of plants imported by us during the past thirty years, we have rarely noticed a single seed capsule.* The inference is thence by no means an unreasonable one that the fertilisation of the flower by insect agency is a rare, or comparatively rare occurrence, and the perpetuation of the species must depend chiefly on new growths from the rhizome by which the plants spread laterally, so far as food materials are at hand to support them. But the stations in which, for the most part, they are found, and where they must have originally sprung from the stray seeds that lodged there, are in the crevices of rocks, and in a few cases on the branches of trees, where there is necessarily an extremely restricted accumulation of vegetable matter; their spread by this means is thence reduced to the narrowest limits.

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* *Cypripedium Schlimii* is an exception. The flowers of this species are self-fertilising, which often results in the maturing of seed capsules, with the effect, however, of producing a progeny so enfeebled in constitution, that it is one of the most difficult of Cypripedes to import alive and to get established in the glass houses of Europe. Its excessive fertility is its own destruction.

† *See* illustration, page 7.

‡ *Fertilisation of Flowers*, translated by D. W. Thompson, p. 539. For the manner in which the fertilisation of Cypripedium would be effected through the intervention of bees or other insects, the reader is referred to the place here quoted, and to Darwin's *Fertilisation of Orchids*, p. 270.

The chief distinctions between Cypripedium and the genera of other tribes consist—in the presence of three stigmas, but which are confluent and have the aspect of being but one; † in the rostellum being so modified in form, that by some eminent naturalists it has been thought to be altogether absent; in the presence of two anthers, which, however, belong to the inner whorl of three, instead of the single anther of the outer whorl in other orchids, which is here represented by a barren staminodium, a shield-like projecting body generally notched or hollowed out on its front margin, but sometimes with a small angular projection there.‡ Far more apparent to the observer even than these important characters, is the prominent pouched labellum, which although not peculiar to the genus, is here more decidedly slipper-shaped than in any other. The conspicuous dorsal or upper sepal and the spreading narrow petals, sometimes greatly elongated, are noteworthy features of the flower of a Cypripedium, as is also the remarkable combination of many and diverse tints with which the flowers of most of the species are adorned. The flowers too retain their freshness for a longer period than those of any other orchids, except, perhaps, some of the Vandas.

The circumscription of the genus, as it is understood by horticulturists, has been somewhat modified within the last few years; in the first instance by Reichenbach, who separated the South American species from Cypripedium on account of their having a three-celled ovary (the ovary of the true Cypripedes is unilocular), constituting them a new genus, which he called Selenipedium.[*] In this he is followed by Bentham and Hooker in their *Genera Plantarum*,[†] the first-named botanist citing as a reason that "the important character of the three-celled ovary and axile placentation,[‡] together with a slight difference in habit and inflorescence, justify the South American species being maintained as a distinct genus, connecting Cypripedium with Apostasia and Neuwiedia,"[§] these last-named two genera including some seven or eight species, forming a very curious group of orchids that inhabit the Malayan Archipelago, but which are of scientific interest only. We have, however, strong grounds for believing that this dismemberment of the Cypripedia is not final; for notwithstanding the very important difference in the structure of the ovary of the South American species, these cross with the Cypripedia of India and the Malay Archipelago, and progenies derived from this hybridisation have been for some time in existence, and are receiving yearly additions to their number from various operators. The facts of the case, as it now stands, must, however, be fairly stated; the East Indian species cross freely with each other, and a numerous progeny of hybrids has resulted therefrom; the South American species also cross freely with each other, and many new forms have been obtained; the hybrids in both sections flower within a few years from the germination of the seed. But in the case of the crossing of the Indian with the South American species, the process has been much slower in producing results; an infinitely smaller proportion of the seed germinates, and those seedlings that survive are so slow in arriving at the flowering stage, that up to the present time,

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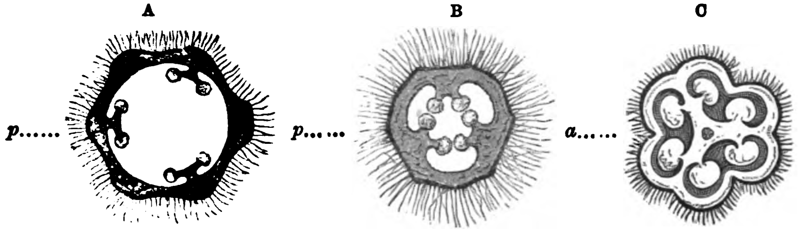
* *Cypripedium barbatum*, *C. Stonei*, and *C. villosum* are the only Indian species that we can remember receiving with capsules, and these but very few in number, especially with the two last named.

† If the stigmatic plate of almost any Cypripedium be examined, its tripartite character will be seen to be indicated by the presence of three sunk lines diverging from the centre at an angle of 120°.

‡ The Homology of orchid flowers is discussed in another place.



Transverse sections of one-celled ovaries of (A) *Cypripedium Curtisii*, (B) *C. Haynaldianum*, showing parietal placentation (*p*), and of three-celled ovary of (C) *C. Sedenii*, showing axile placentation (*a*). All proportionately enlarged.

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[*] Xen. Orch. I. p. 3, but afterwards abandoned by the author in his subsequent articles in the *Gardeners' Chronicle*. See Gard. Chron. XVIII. (1882), p. 520; XXII. (1884), p. 489; XXIII. (1885), p. 270; XXV. (1886), p. 680 and *passim*.

[†] Vol. III. p. 634.

[‡] The part of the ovary to which the ovules, the bodies which ultimately develop into seeds, are attached, is called the placenta; if the ovules are attached to the common axis of a many-celled ovary, the placentation is said to be axile; but if to the inner walls, or certain portions of them, the placentation is then called parietal.

[§] Jour. Linn. Soc. XVIII. p. 359.

so far as we are aware, not a single plant has flowered, although the plants in our houses continue strong and healthy in appearance, and yearly increase in size. Till these plants flower—and there is no apparent ground for belief that they will not—and the structure of the ovary of their flowers shall have been examined, we prefer to adhere to the original circumscription of the genus, certainly a very natural one, and to regard the ovarium character as of sectional value only. This view is strengthened by the discovery and introduction of the remarkable *Cypripedium Sanderianum*, a Malayan species that brings the relationship between the East Indian and South American Cypripedes morphologically still nearer than its previously known allies, *C. Parishii*, *C. Stonei*, *C. philippinense*, etc., had done.

The species, varieties and hybrids described in the following pages will therefore come under the following heads:—

I. EUCYPRIPEDIA, including only the East Indian and Malayan species that constitute Bentham's (sub-section) *Coriaceæ*.

II. SELENIPEDIA, coinciding with Reichenbach's *Selenipedium*, and including the anomalous *Uropedium Lindenii* of Lindley.

III. GARDEN HYBRIDS in two divisions, (*a*) Eucypripedium hybrids; (*b*) Selenipedium hybrids.

The genus Cypripedium was founded by Linnæus on our native species *Cypripedium Calceolus*, now unfortunately become exceedingly rare, if not altogether lost as a wild plant in England, although still plentiful in some localities in Central Europe. The name is derived from Κύπρις (Kupris), one of the Greek names of Venus, and πόδιον (podion), "a slipper," in reference to the slipper-like form of the labellum; whence also the popular names "Lady's Slipper" and "Slipperworts."

EUCYPRIPEDIA.

The true Cypripedia are recognised by the following characters, omitting those possessed only by the species inhabiting the north temperate regions of both hemispheres, of which we take no cognisance.*

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* These hardy Cypripedes are divided by Bentham, following Lindley, into two sections:—I. *Foliosæ*: species with leafy stems, of which *Cypripedium Calceolus* may be taken as the type. II. *Diphyllæ*: species with two leaves only, as *C. japonicum*, *C. acaule*, and two or three others. All the included species of both sections are deciduous, and have an underground rhizome that remains dormant during the winter.

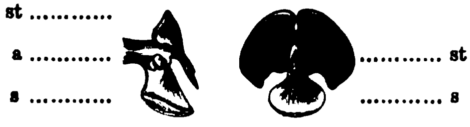
The *sepals* are spreading; the upper or dorsal one is free, the lateral two are connate to their apices,* and are together smaller than the upper one, and lie under the labellum.

The *petals* are also spreading, free, much narrower than the sepals, and usually bearded at the base.

The *lip* is inflated, calceiform, the lateral lobes at the base small and turned inwards, their edges nearly meeting; the inner surface opposite the aperture is pubescent or setose.†

The *column* is short and terete, pubescent, or studded with stiffish erect hairs.

The fertile *anthers* are two, one placed on each side of the column, behind the stigmatic plate, and usually sessile; the pollen is granulose, but "coated by a viscid fluid, so glutinous that it can be drawn into threads."



Side and front view of sexual apparatus of *Cypripedium barbatum*: a. anther; st. staminode; s. stigmatic plate.

The third anther is reduced to a variously shaped barren *staminodium*, forming a large apical plate, which, owing to the oblique position of the column with respect to the ovary, conceals in most of the species the fertile stamens and the stigma.

The *ovary* is unilocular with parietal placentation, the rudimentary ovules being placed along the parallel edges of each of three broad ribs.

The *capsule* is elongated, spindle-shaped, frequently angular.

In their vegetation, the tropical Cypripedes are perennial stemless herbs with persistent foliage, increasing in size by lateral growths, usually forming in their native haunts small tufts in the crevices of the rocks, or in the forks of the branches of trees in the case of those species that are more distinctly epiphytal; but where the food material is more abundant, forming larger patches that cover a considerable space.

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* Sometimes (by dialysis) disjoined down to about one-third or even less of their length from the base, a condition that is normal in *Cypripedium arietinum*, a foliose North American species. This dialysis occurs chiefly in the first flowers produced by newly imported plants.

† The lip is distinctly three-lobed, the intermediate lobe greatly exceeding in size the lateral two. The slipper or pouch is formed chiefly by the large middle lobe, whose sides are folded over and joined together at the edges, the suture or line of junction being distinctly perceptible in nearly all the species. It is evident that, owing to this peculiarity, it is really the *under* (dorsal) surface of the labellum that is exposed to view, and which in most orchids is usually of a very dull colour compared with the brilliant hues of the upper (ventral) surface. If the pouch be cut down the suture so as to expose to view what is really the upper surface of the labellum, it will be found that in many species this is also the brightest coloured, especially the central and basal area, to which the light has access.

The *roots* are developed from a short stout rhizome, which in this section is rarely creeping; they are fleshy, cord-like, attaining a considerable length, and are clothed with fibrous rootlets, not unlike those produced from the climbing stems of the Ivy, and cling with extraordinary tenacity to the surfaces over which they creep.

The *leaves* are also produced from the rhizome, five to eight to each growth, distichous (pointing two ways only) and alternate, the lowermost sometimes reduced to leaf-like sheaths; they are generally narrow in proportion to their length, in some species strap-like, in others linear-lanceolate, oblong-lanceolate, or some modification of those forms; they are channelled along the middle on the upper side and keeled beneath, more or less complicate and sheathing at the base, and acute or bifid at the apex, green in colour, often mottled or tesselated: in some species the under surface is spotted or stained with dull purple.*

The *scape* issues from between the imbricating bases of the leaves, the uppermost of which frequently takes the form of a small upright compressed sheath that embraces the peduncle. It is usually erect, but sometimes nodding or slightly flexuose, of a deep dull purple (rarely green), very hairy, and furnished with a spathaceous bract at the base of the club-shaped ovary.† In most of the species the flowers are solitary, rarely in twos; in *Cypripedium Lowii*, *C. Stonei*, *C. Parishii*, *C. philippinense* and three or four other species, the scapes are 3—5 or more flowered.

Geographical distribution.—Up to the present time about thirty species in this section are well authenticated, all natives of a region lying between the 27th parallel of north and the 10th parallel of south latitude, and between the 75th and 150th meridians of east longitude; they are altogether absent from Australia, and so far as at present known, from Africa and Madagascar; they are thence confined to a comparatively limited space within the Indian Monsoon region. They either follow certain mountain chains on which the species occur in groups of twos and threes, or are isolated and far remote from each other, or they are confined to particular islands or group of islands. In the former case they usually occur at a considerable elevation, where the rainfall is copious and frequent, and the dry season of short duration; in these elevated situations they are found growing chiefly on the ledges and in the crevices of the limestone rocks, which constitute the chief geological features

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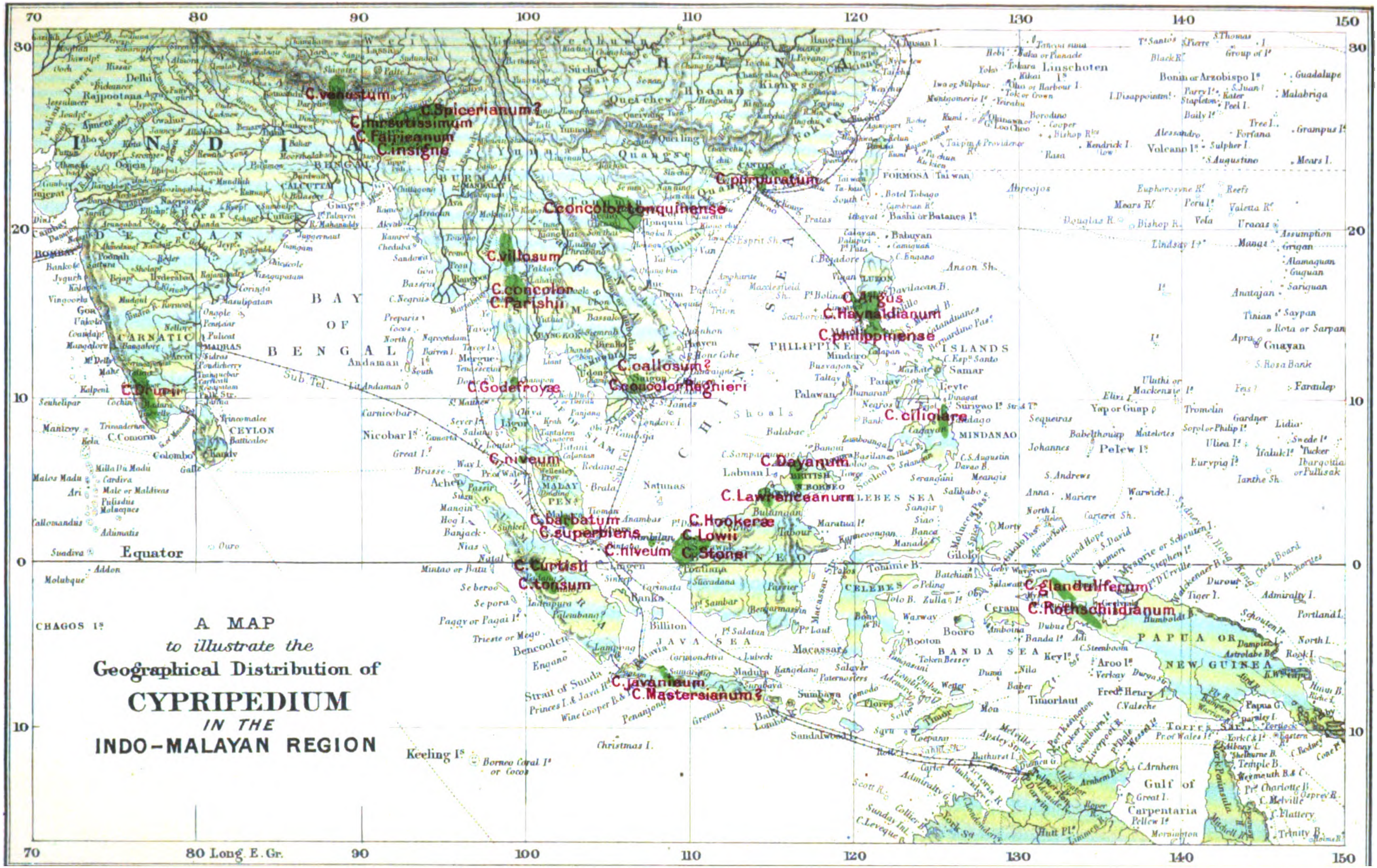
* The foliage of some of the species and hybrids is extremely ornamental, *e.g.*, *Cypripedium Hookeræ*, *C. Lawrenceanum*, *C. javanicum*, *C. marmorophyllum*, etc.

† In *Cypripedium callosum* and *C. niveum*, there are two small opposite bracts at the base of the ovary.



A MAP
to illustrate the
Geographical Distribution of
CYPRIPEDIUM
IN THE
INDO-MALAYAN REGION

of these mountain ranges, in places where there is a small accumulation of decaying vegetable matter. These localities are often steep and precipitous, extremely difficult of access, sometimes fully exposed to the sun's rays, but more frequently in partial shade afforded by projections and overhanging trees. The insular species usually occur at a much lower elevation, not infrequently close to the sea shore, and where the mean average temperature is naturally higher than that in which the mountain species grow. At least three species have been observed to have their homes on the stems and in the forks of the branches of trees,* sometimes growing on the decaying fibrous roots of ferns.

By far the greater part of the Indian and Malayan Cypripedium region lies within the equatorial zone, and is thence subject to all the climatic phenomena peculiar to that zone; these are fully stated in the introductory notes to Dendrobium. The species found outside this zone are chiefly North Indian, and occur on the Sylhet, Khasia, and Garrow Hills, also in parts of the lower Himalayan range, extending from Sikkim to Eastern Assam, succeeded still further eastwards in Hongkong and on the mountains in southern China by *Cypripedium purpuratum;* the climate of this part of the region is also described in our notes on the geographical distribution of Dendrobium, to which the reader is referred.†

Cultural Note.—No genus or race of orchids that has yet been brought under cultivation has yielded so readily, and we may add, so strikingly, to its influence as the Cypripedia. This is not only apparent in the results of hybridisation, which will be noticed more particularly after the description of the species, but also in the species themselves, especially in those that have been longest under the cultivator's care. The most obvious effects of cultural influence have been the development of more robust foliage of a brighter colour, especially in those species with tesselated leaves; the normally one-flowered scape occasionally becomes two-flowered; the scapes themselves are more robust, often more elongated, and produce larger flowers, generally attended with some modification in colour.‡ Doubtless the chief cause of these changes is the more abundant and more regular supply of food material, by which the plants acquire a vigour rarely seen in those imported from their native countries.

* *Cypripedium Lowii, C. Parishii,* and *C. villosum.*

† Part III. pp. 7—9.

‡ The variability in the size and colour of the flowers brought about by cultivation has been the most fruitful source of the existing sub-varieties, whose number is becoming practically unlimited. The consequence of this has been the creation of an overwhelming Cypripedium nomenclature, often so confused and perplexing, that it is found impossible to deal with it in its entirety within the limits of the present work.

The geographical distribution of the Cypripedia included in this section sufficiently indicates the temperature in which they should be cultivated in the glass houses of Europe, which is that of the East Indian house for most of the species and hybrids, that is to say, a house in which the night temperature in winter is never allowed to sink below 15°—12° C. (60°—55° F.), with a gradual rise as the season advances, to 18°—21° C (65—70° F.), at which it should be maintained from May to August. The day temperatures by fire-heat alone should be about 3° C. (5°—6° F.) above those of the night. A few species, chiefly insular, including *Cypripedium concolor*, *C. niveum*, *C. Godefroyæ*, *C. philippinense*, etc., thrive best in the higher temperature of the Phalænopsis house; on the other hand, *C. insigne*, *C. venustum*, *C. Fairieanum*, and the hybrids obtained from them may be cultivated in the intermediate house.

It is evident, too, that as the great majority of the tropical species occur within the equatorial belt, or sufficiently near it to come under the like climatic conditions, of which the most noteworthy are the remarkable uniformity of temperature and the high degree of atmospheric humidity throughout the year, there is practically little or no interruption in their vegetation in their native homes. But when transferred to the glass houses of this country, it is equally clear that such an uniformity of climatic conditions cannot be so strictly maintained by artificial means owing to the succession of seasons; hence there is, at least, a partial cessation of growth if not of absolute rest during the coldest months of the year. Advantage should be taken of the recommencement of their growing seasons to re-pot the plants not then in flower; they should be potted in a compost of sphagnum moss and fibrous peat in about equal proportions; the drainage should be quite free; it should consist of clean broken crocks with which the pots should be filled to one-half or even to two-thirds of their depth, according to the size of the plants. As the roots of Cypripedium grow vigorously, ample provision should be made for their development.

The plants must at no time be suffered to get dry at their roots during their growing season; a high degree of moisture must be maintained in the atmosphere of the house, the amount and frequency of the watering and the sprinkling of the floors, etc., of the house being, of course, regulated by the season of the year and the external circumstances of weather, etc. The ventilation must also be regulated according to external influences, but it should at all times be as free as is consistent with the well-being of the plants, avoiding cold draughts and sudden changes of temperature. In the summer months the plants should be protected by shading from the direct rays of the sun; a very slight exposure to direct sunlight at that season causes the foliage to change colour; this is particularly the case with those species that have tesselated leaves.

SYNOPSIS OF SPECIES AND VARIETIES.

Cypripedium Argus.

Leaves elliptic or oblong-lanceolate, acute, 5—8 inches long, 1—1½ inches broad, pale green, tesselated with oblong dark green spots. Scapes 12—15 or more inches long, one- (rarely two-) flowered. Bract about half the length of the ovary. Flowers 2½—3 inches across vertically; upper sepal broadly ovate-cordate, pointed, minutely ciliolate at the margin, white with alternately longer and shorter longitudinal veins that are sometimes all green, sometimes the longer ones purple and the shorter ones green, the basal area occasionally spotted with blackish purple; lower sepal similar but smaller, notched at the tip, the veins paler and uniform; petals deflexed and undulate, ligulate, acute, margins ciliate, white with pale green veins to two-thirds of their length, the apical third pale purple, the whole inner surface more or less densely spotted with blackish warts, some of which are ocellated; lip broadly calceiform, dull brownish purple above, pale greenish brown beneath; infolded lobes narrow, pale purple spotted with deep purple. Staminode nearly horseshoe-shaped, with two incurved cusps.

Cypripedium Argus, Rchb. in Gard. Chron. 1873, p. 608. Id. I. (1874), p. 690. *Bot. Mag.* t. 6175. *Fl. Mag.* n. s. t. 220. *Belg. hort. XXXII* (1882), p. 241. C. barbatum Argus, Belg. hort. XXV. p. 57 (1875). C. Pitcherianum, W. A. Manda in Amer. Flor. III. (1887), p. 178.

var.—Moensii.

Dorsal sepal and petals broader than in the common forms; the spots on the petals larger and more numerous.

C. Argus Moensii, Hort. et supra.

sub-var, distinguished by colour only.—*nigricans* (syns. *nigrum*, *nigro-maculatum*), the black warts on the petals much crowded and often confluent, covering the greater portion of the whole area.

Cypripedium Argus was discovered by Gustav Wallis, in 1872, in Luzon, the principal island of the Philippine group, and was introduced by us through him immediately afterwards; it flowered for the first time in Europe in our Chelsea nursery in April of the following year. Its tesselated foliage, broad upper sepal, warty petals and horseshoe-shaped staminode, clearly indicate its close affinity to a group of Cypripedes of which *C. venustum* is the type. Like most of its congeners it is a variable species, but the deviations from the type are not of a very marked character, the two forms described above being the most distinct that have yet come under our cognisance, the first of which appeared in the collection of M. Moens, at Lede, in Belgium. The warty eye-like spots on the petals of *C. Argus* form one of its most striking characteristics, and suggested its specific name;* these spots vary considerably in number and size, and occasionally spread into the other segments, especially the basal part of the upper sepal.

C. barbatum.

Leaves narrowly oblong, or oblong-lanceolate, acute, 4—6 or more inches long, pale dull green above, tesselated with oblong deep green spots. Scapes 9—12 inches high, one- (rarely two-) flowered. Bract small, about one fourth as long as the ovary. Flowers 2½—3 inches across vertically; upper sepal sub-orbicular, folded at the mid-vein, pointed, green at the base, the remainder white, more or less stained with vinous purple; veins prominent, deep purple, the central ones green at the base; lower sepal much smaller, ovate, acute, pale green with deep green and purple veins; petals linear-oblong, spreading, slightly deflexed, with ciliate margins, the superior one fringed with small blackish warts, brownish green towards the base, purplish towards and at the apex; lip projecting forwards, helmet shaped, deep brownish purple, paler beneath; infolded lobes purple spotted with deeper purple. Staminode horseshoe-shaped, with a deep cleft in the back convex edge, and a tooth in the front concave side.

Cypripedium barbatum, Lindl. in Bot. Reg. 1841, misc. 110. *Id.* 1842, t. 17. *Bot. Mag.* t. 4234. Van Houtte's *Fl. des Serres, III.* t. 190. *Id. XVIII,* t. 1879 (grandiflorum). *Belg. hort. XXXIII.* p. 96, t. 7.

var.—Crossii.

Plant dwarfer and denser. Leaves paler with the deep green blotches more scattered. Flowers usually brighter in colour than the typical *Cypripedium barbatum,* and well distinguished by the broad often Λ-shaped band of vinous purple on the upper sepal; by the more deflexed petals with fewer warts on the superior margin; and by the differently coloured lip.

C. barbatum Crossii, Hort., prior to 1865. C. Crossii, *Belg. hort. XV.* p. 227 (1865). C. barbatum Warnerianum, Warner's *Sel. Orch. III.* t. 11 (1870). C. barbatum biflorum, Hort. C. orbum, Rchb. in Gard. Chron. II. s. 3 (1887), p. 778.

var.—Obrienii.

As compared with the preceding, the leaves are of a paler green, with fewer deep green spots that are usually very small; the upper sepal is somewhat more orbicular, the purple stain more diffused; the petals are less deflexed and of a deeper colour, as is also the lip.

C. barbatum Obrienii, supra.

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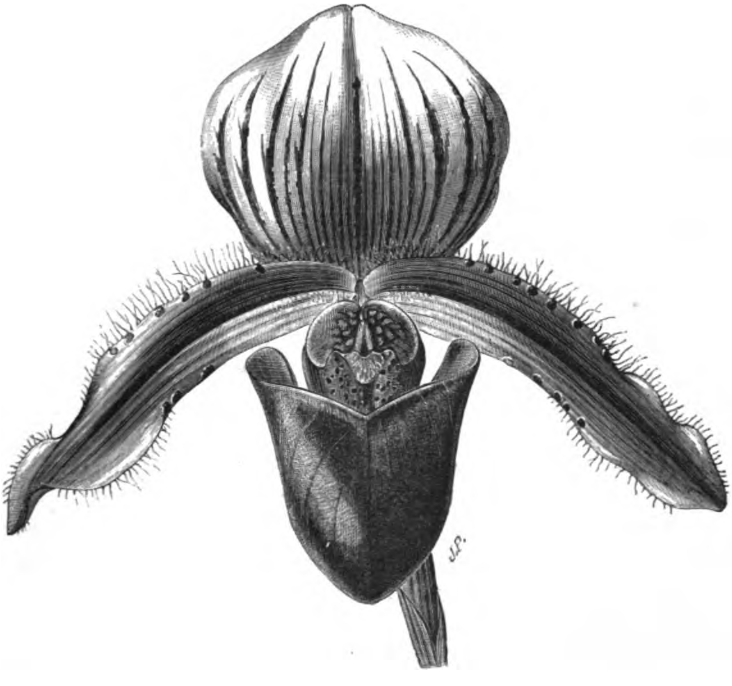
* The Argus of Greek mythology was a monster surnamed Panoptis, "the All-seeing," because he had a hundred eyes. He was appointed by Hera (Juno) guardian of the cow, into which Io had been metamorphosed, but Mercury, at the command of Jupiter, sent him to sleep by the sweet notes of his flute and then cut off his head. Juno transplanted his eyes to the tail of the peacock, her favourite bird.

sub-vars.—*grandiflorum* (Van Houtte's Fl. des Serres, *loc. cit. supra*), *majus*, *maximum*, *nigrum*, *pallidum*, *pictum*, *purpureum*, *pulcherrimum*, etc., names that sufficiently indicate the character of the forms to which they have been applied.

Cypripedium barbatum is a native of Mount Ophir, near Malacca, in the Malay Peninsula, where it was discovered in 1840 by Cuming, and sent by him to Messrs. Loddiges, in whose nursery at Hackney it flowered for the first time in this country in the summer of the following year. Three years later it was collected in the same locality by Thomas Lobb, who sent plants to the Exeter Nursery, whence it became generally distributed among the orchid collections of Europe. Ever since its introduction it has proved a most useful garden plant, flowering freely in June and July, and continuing several weeks in bloom. As one of the longest of the coriaceous Cypripedes in cultivation (it is the fourth in chronological order of introduction), it has also proved one of the most yielding to cultural influence, and has sported into numerous sub-varieties, many of which show a marked



Cypripedium barbatum.

improvement, from a floral point of view, on the originally introduced type; it is also a very potent agent in hybridisation, crossing freely with members of its own group,* and also with other species, the resulting progenies being among the most varied in form and colour that have yet been obtained within the range of orchid hybridisation. The variety *Crossii* is very distinct; its foliage is of a lighter hue than that of the species, and it flowers much earlier in the year, coming into bloom in March and April, and even earlier. It originated, without doubt, among the importations from Mount Ophir, but from whom and when it received its first designation, does not appear to have been recorded.† Like the species, it has become very variable under cultivation, and many sub-varieties are recognised by horticulturists. The variety *Obrienii* is intermediate between the typical *C. barbatum* and the variety *Crossii* with which it is best compared, and with which its flowering season is contemporaneous.

The specific name, *barbatum*, "bearded," refers to the "hairy shining warts which border the upper edge of the petals"; but as many other species have the same peculiarity, the name is far from being exclusively appropriate to *Cypripedium barbatum*.

C. bellatulum.

Leaves elliptic-oblong, 7—10 inches long, 3—3½ inches broad, equitant, obtuse or unequally bilobed at apex, deep green somewhat sparingly mottled with pale green above, deep dull purple beneath. Scapes shorter than the leaves, deep purple and pubescent, one-flowered. Bract more than half as long as the ovary. Flowers 2—3 inches in diameter, white or pale yellow, conspicuously spotted with brown-purple, the spots on the sepals more or less aggregated towards the base; upper sepal oblate-orbicular, keeled behind, minutely ciliolate as are the lower sepal and petals; lower sepal smaller than the upper one, broadly ovate; petals depressed, broadly oval; lip saccate, compressed as in *Cypripedium concolor*, with fewer and smaller spots externally than the other segments, but densely spotted on the infolded lobes. Staminode sub-rhomboidal, nearly sub-orbicular.

Cypripedium bellatulum, Rchb. in Gard. Chron. III., s. 3 (1888), p. 648.

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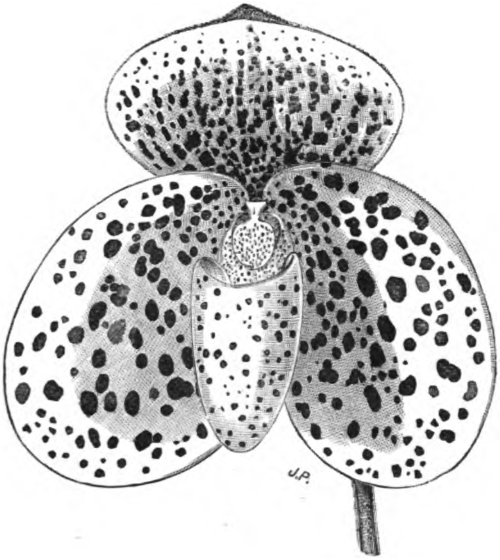
* The sub-section with tesselated foliage, etc., of which *Cypripedium venustum* is the type. See *C. Argus, supra.*

† In the letterpress accompanying the coloured plate in the *Belgique horticole*, it is said to have been discovered in Peru by Cross. Its Peruvian origin is manifestly an error; its association with Cross, the traveller, is also doubtful, it being more probable that another Cross, gardener to Louisa Lady Ashburton at Melchet Court, and raiser of the hybrid that bears his name, may have been the first to detect it in the orchid collection under his charge.

This Cypripede was introduced in the spring of the present year (1888) by Messrs. Low and Co., of Clapton, who have given no indication of its origin. The flowers conform, with the exception of their larger size and bolder spotting, generally to those of *Cypripedium Godefroyæ*,* but the leaves differ very considerably in form, colour and size from those of *C. Godefroyæ*, some of them being fully three times as large, thus affording undoubted evidence of a geographical station with an environment very different from that in which the typical *C. Godefroyæ* occurs. In the absence of information respecting its origin, and till further experience of its behaviour under cultivation shall have been obtained, we have provisionally described it as a distinct form, although from a botanical point of view we are at present unable to recognise its claim to specific rank.



Cypripedium bellatulum.

C. callosum.

Leaves oval-oblong, acute, 6—9 inches long, variable in colour, usually bright green, with blackish green hieroglyphic markings and tesselations above, but often much paler; grey-green and keeled beneath. Scape 12—15 inches high, one- (sometimes two-) flowered, bibracteate, the dorsal bract one-third the length of the ovary, the ventral one much shorter. Flowers among the largest in the genus; upper sepal broadly cordate, 2½—3 inches broad, folded at the mid-vein and undulate in the apical half, white with numerous alternately longer and shorter veins that are green at the base and deep vinous purple upwards; lower sepal much smaller, lanceolate, acute, white with pale green veins; petals ligulate, spreading, slightly deflexed, pale green tinted with pale rose-purple towards the apex, margins ciliate with 4—5 blackish warts on the superior one; lip helmet-shaped, brown-purple, greenish beneath, the infolded lobes spotted with deep purple. Staminode horseshoe-shaped, with a deep cleft in the back margin, the two lobes terminating in cusps in front, between which is a projecting tooth.

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* The flowers are remarkably variable as regards colour, the ground colour varying from pale yellow to ivory-white, sometimes tinged with pale purple, while the back of the segments are more or less blotched and stained with vinous purple; the spotting is also very variable, the spots being sometimes large and scattered, sometimes small and dense, with many intermediate states.

Cypripedium callosum, Rchb. in Gard. Chron. XXVI. (1886), p. 326. Id. I. s. 3 (1887), p. 314—15, icon. xyl. Godefroy's *Orchidophile VIII.* (1887), p. 145.

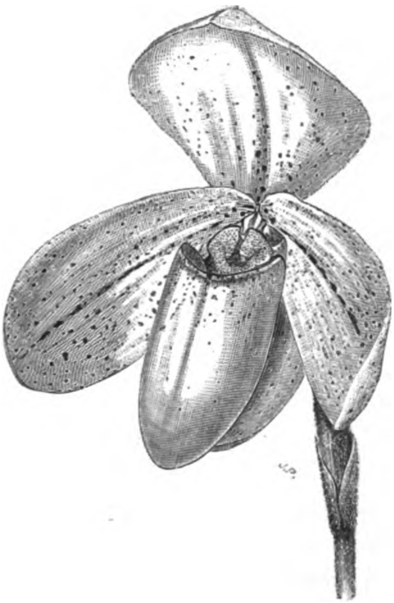
A recent addition to the genus that was discovered by M. Alexandre Regnier, of Paris, in Siam or Cochin China, and introduced by him in 1885, but nothing has yet been divulged respecting the locality in which this species grows or its environment there. Its enormous upper sepal renders it remarkable among Cypripedes, even when it is compared with that of *Cypripedium Lawrenceanum;* as a species it is intermediate between the last named and *C. barbatum,* from which its larger flowers, and especially its broader upper sepal and petals, chiefly distinguish it. *C. callosum* usually flowers in February and March.

C. ciliolare.

Leaves narrowly oblong or elliptic-oblong, obtuse, 6 or more inches long, tesselated with deep and pale green. Scapes 12—15 inches high, one-flowered. Bract small, about one-third the length of the ovary. Flowers 4 inches across vertically; upper sepal broadly ovate, acuminate, ciliolate at the margin, purple at the base, the remainder white; veins close set, alternately longer and shorter, the shorter ones the narrowest, green, but sometimes purple towards the lateral margins; lower sepal much smaller, ovate, acuminate, whitish with green veins; petals ligulate, deflexed and recurved, margined with long black hairs, the basal portion green, densely spotted with blackish warts to two-thirds of the length, the apical portion pale purple; lip prominent, helmet-shaped, dull purplish brown, the infolded lobes pale yellow-green spotted with purple warts. Staminode reniform, greenish stained with pale rose, with a notch in the basal edge, obscurely five-toothed on the distal margin.

Cypripedium ciliolare, Rchb. in Gard. Chron. XVIII (1882), p. 488. *Illus. hort.* 1884, t. 530.

Introduced from the Philippine Islands in 1882 by Messrs. Low and Co., of Clapton; it was also gathered by our own collector early in the following year on the small islets off the north-east coast of Mindanao. It is one of the handsomest of the group to which it belongs, being very near *Cypripedium superbiens,* from which it is easily distinguished by its shorter differently coloured upper sepal; by the denser and more numerous marginal hairs of the petals, which suggested the specific name; by the spotting and deeper colour of the petals, which are also broader and more reflexed at the apex; and by the somewhat smaller lip of a deeper and duller colour, and with a shorter claw. It flowers in April and May.



Cypripedium concolor.

C. concolor.

Leaves oval-oblong, 3—5 inches long, mottled above with greyish green on a deep green ground, more or less spotted beneath with deep purplish crimson. Scapes short, one- but not infrequently two-flowered, with a small boat-shaped closely-appressed bract at the base of the ovary. Flowers 2—3 inches across, pale yellow sprinkled with minute purple dots that are often aggregated towards the base of the sepals and petals, and on the infolded lobes of the lip; upper sepal sub-orbicular, keeled behind; lower sepal ovate, generally smaller than the upper one, but sometimes nearly equal to it; petals broadly elliptic-oblong, obtuse, depressed; both sepals and petals fringed with minute hairs; lip small, conical in outline, compressed. Staminode sub-rhomboidal, with a deep yellow blotch dotted with purple in the centre.

Cypripedium concolor, Parish, in MS. *Bot. Mag.* t. 5513 (1865). Rchb. in Gard. Chron. 1865, p. 626. Id. XIX. (1883), p. 19, icon. xyl. *Illus. hort.* 1865, t. 444. Regel's *Gartenfl.* 1874, t. 803. Van Houtte's *Fl. des Serres*, 1877—79, t. 2321. Williams' *Orch. Alb. VII.* t. 302.

var.—chlorophyllum.

Leaves much paler in colour, the purple spotting on the under side almost entirely absent. The flowers are distinguished by an uninterrupted line of purple spots along the mid-veins of the sepals and petals.

C. concolor chlorophyllum, Rchb. in Gard. Chron. XXVI. (1886), p. 294.

var.—Regnieri.

Leaves somewhat longer, with a lighter tesselation above and fewer spots beneath. Scapes branched, 3—5 flowered; the flowers generally of a deeper yellow with the petals broader and more rotund.

C. concolor Regnieri, Rchb. in Gard. Chron. XXV. (1886), p. 362. Godefroy's *Orchidophile*, 1886, p. 226.

var.—tonquinense.

Leaves elliptic oblong, broader than in the Moulmein form. Upper sepal and petals broader, the latter more rotund, with the purple spots more aggregated towards their base.

C. concolor tonquinense, Godefroy's *Orchidophile*, 1886, p. 228 (tongkinense). Rev. hort. 1885, p. 436.

Cypripedium concolor was discovered by the Rev. C. Parish, in 1859, at a place called Pya-Thonzoo (The Three Pagodas) in the neighbourhood of Moulmein, growing in hollows in the rock that are filled with decaying vegetable matter, and subsequently in other similar places; it was not, however, introduced into European gardens till 1864, when living plants were imported by Messrs. Low and Co. About the same time, or shortly afterwards, it was sent to the Royal Gardens at Kew by Colonel Benson, from the locality in which it had been first discovered by the Rev. C. Parish; and quite recently it has been received at the Royal Gardens from the Birds' Nests' Islands near Champon, where it grows on the limestone cliffs facing the sea.* The variety *chlorophyllum* appeared among a recent importation by Messrs.

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* The Garden, XVIII. (1885), p. 342.

Sander and Co.; *Regnieri* was the last discovery of the late Auguste Regnier, in Cambodia, and was introduced by M. Godefroy, of Argenteuil, near Paris, in 1885; *tonquinense* was first sent to an amateur cultivator of orchids in France by a French missionary in Tongkin; the geographical distribution of *C. concolor* is thence more extensive than that of any of the coriaceous Cypripedes yet known. Nor is this its chief peculiarity; it is the type of a small group that includes *C. niveum, C. Godefroyæ*, and *C. bellatulum*, a group so beautiful and so distinct from all other Cypripedes in cultivation that the forms comprising it are justly reckoned among the gems of the Orchid World.

It is necessary, however, that the botanical relationship between these forms should be plainly set forth; this can be best done by comparing *Cypripedium concolor* with *C. niveum*, the two extremes of the series; thus, the yellow flowers with narrower upper sepal and petals, compressed labellum, and sub-rhomboidal staminode of the former clearly distinguish it from the latter, which has white flowers with broader and more rounded petals, much smaller lower sepal, a more inflated labellum with a contracted aperture. and a sub-reniform staminode; moreover, the shorter scape, the shorter ovary with larger bract, and the differently coloured leaves of *C. concolor* afford further distinguishing characters between the two. Nevertheless all these differences are effectually bridged over by the variable *C. Godefroyæ* and the recently introduced and scarcely less variable *C. bellatulum*, in which all the organs we have enumerated above are sometimes so modified, that some of their forms approach very closely *C. concolor*, while others come so near *C. niveum* as to be scarcely distinguishable from it. In the broader view taken by science of the relationship subsisting between the members of a genus, these Cypripedes are but varieties of one type, but in horticulture they will continue to be regarded as distinct, and as such they are treated in this work.

Cultural Note.—The preference shown by *Cypripedium concolor* for limestone is manifested even under cultivation, for it unquestionably thrives better on a substratum or drainage composed of nodules of limestone than of broken crocks. In potting small plants, or plants that require pots not larger than 4—5 inches in diameter, the pots should be filled to about two-thirds of their depth with small pieces of limestone, among which the longest of the fleshy roots should be laid, and to which they will soon firmly cling; the plants may then be put into a compost of fibrous peat and sphagnum in equal proportions, care being taken not to raise them above the level of the rim of the pot. As may be inferred from the situation and climate of Moulmein and the other stations of the species, *C. concolor* requires a high temperature with a moist atmosphere, such as is maintained in the Phalænopsis or East Indian house, where the mean average temperature by fire-heat ranges from 18° to 24° C. (65°—75° F.) during the year. Water must be freely supplied at all times.

C. Curtisii.

Leaves oblong, or oval-oblong, 6—8 inches long, tesselated above with deep and pale green. Scapes 9—12 or more inches high, one-flowered. Bract about one-third the length of the ovary. Flowers large, with all the segments ciliolate; upper sepal somewhat small in proportion to the size of the flower, broadly cordate, acuminate, grass-green, with a broad white margin, and sometimes with a purple stain on each side next the white margin, veins numerous and close set, green, changing to brownish purple towards the base; lower sepal smaller, ovate, acuminate; petals ligulate, deflexed, recurved at the tip, margined with blackish hairs and warts, veined with green, and almost uniformly spotted with purple on a pale purple ground that is almost white along the mid-vein; lip large, helmet-shaped, dull brownish purple, the infolded lobes narrow, pale purple spotted with purplish warts. Staminode broadly horseshoe-shaped, with deep notch on the basal side, and three small teeth between the pointed incurved arms.

Cypripedium Curtisii, Rchb. in Gard. Chron. XX. (1883), p. 8. Williams' *Orch. Alb. III.* t. 122.

Introduced by us from Sumatra in 1882 through our collector Curtis, who discovered it at some distance from Padang, at an elevation of 3,000—4,000 feet, on the great mountain range that stretches almost through the entire length of the island. Its nearest affinities are *Cypripedium superbiens* and *C. ciliolare,* between which it is intermediate, but nearer to the last than to the first-named; from the former it is distinguished by its shorter upper sepal, of which the central area is entirely green; by its shorter differently-coloured petals that are more reflexed at the tip; by its longer and more acuminate bract; and by its deeper green foliage. From the latter it is distinguished by its broader and more acuminate upper sepal; by the shorter cilia of the petals that are also spotted differently; by its longer and more pointed lip, the infolded lobes of which are narrower; and by its longer and more acuminate bract.* *C. Curtisii* usually flowers in May and June.

C. Dayanum.

Leaves elliptic-oblong, acute, 5—7 inches long, variable in colour, sometimes pale green with some oblong spots of deep green scattered over the upper surface, sometimes tesselated with deep and light green. Scapes 8—12 or more inches high, one-flowered. Bract somewhat less than half the length of the ovary. Flowers 4—5 inches across vertically; upper sepal broadly ovate, acuminate, ciliolate, white symmetrically veined with green; lower sepal similar, but smaller and more acuminate; petals ligulate, slightly deflexed, fringed with long black hairs, the basal half brownish green, the distal half dull rose-purple; lip sub-conical and compressed at the apex, brownish purple veined with green, the infolded lobes densely spotted with small purplish warts. Staminode oblong, rounded at the ends, with a cleft in the back, and a projecting tooth on the front margin.

Cypripedium Dayanum, Rchb. in Bot. Zeit. 1862, p. 214.† Id. *Xen. Orch. III.* p. 1, t. 201. Van Houtte's *Fl. des Serres, XV.* t. 1527. C. spectabile (*lapsu calami superbienti*) Dayanum, Lindl. in Gard. Chron. 1860, p. 693. C. Petri, Rchb. in Gard. Chron. XIII (1880), p. 680. C. Burbidgei, Rchb. in Gard. Chron. XVI. (1881), p 38.

We are indebted to the late Mr. Day, to whom this species is dedicated, for the following particulars respecting its introduction. It was discovered on Mount Kina Balu, in north-east Borneo, by Mr. (now Sir Hugh) Low, who sent it, together with *Nepenthes Rajah*, one of the magnificent pitcher plants that has its home on that remarkable mountain,‡ to the nursery of Messrs. Low and Co., at Clapton, from whom Mr. Day acquired the box containing the entire stock of both. All the Nepenthes arrived dead, but a few of the Cypripedium plants survived, and one of these flowered in Mr. Day's collection at Tottenham in the summer of 1860. *Cypripedium Dayanum* remained a rare plant in British gardens till it was re-discovered at the foot of the Marie-Parie Spur of Mount Kina Balu, by Mr. Peter Veitch and Mr. F. W. Burbidge, during their mission to that region for us in 1879. The first introduced type is distinguished by its pale green sparingly spotted foliage and somewhat brighter coloured flowers;* while the leaves of the later introduction are variable in colour, but always darker than in the original form.

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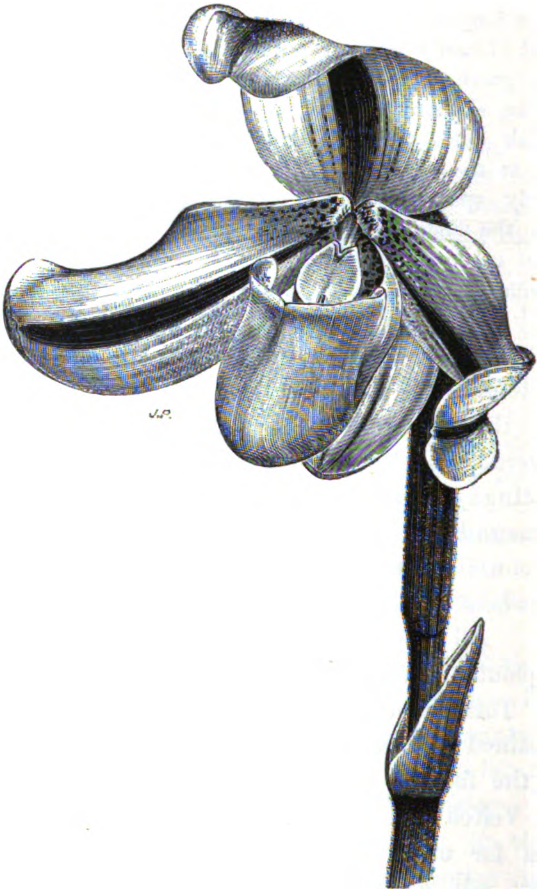
* It is evident from the above comparison that should intermediate forms, other than those obtained by the hybridist, hereafter appear that break through the scarcely specific distinctions pointed out in the text, *Cypripedium ciliolare, C. Curtisii* and *C. superbiens* can then be only regarded as existing geographical expressions of one once widely distributed species.

† It had been previously named *Cypripedium Dayanum* by Stone, Mr. Day's then gardener. *See* Gard. Chron. 1860, p. 674.

‡ Since introduced by us from Kina Balu.

C. Drurii.

Rhizome stoutish, slowly creeping and ascending. Leaves ligulate, acute, 7—10 inches long, of a uniform bright green. Scapes 9—12 inches high, one-flowered. Bract small and sheathing, with very oblique opening. Flowers about 3 inches across vertically; upper sepal broadly oval, inflexed above, ciliolate at the margin, greenish yellow with a broad blackish median band, keeled behind and studded with numerous blackish hairs; lower sepal similar, but smaller and paler in colour, and frequently with two blackish median lines; petals ligulate, inflexed and undulate, ochreous, almost golden yellow, with a broad,



Cypripedium Drurii.

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* It is the *Cypripedium Dayanum superbum* of some collections.

blackish median line and some blackish warts towards the base, and also studded with numerous blackish hairs on the inferior side of the median line; lip helmet-shaped, bright yellow spotted with red-purple on the inside, the infolded lobes not meeting at their edges. Staminode sub-quadrate with a shallow sinus in the front margin, in the centre of which is a minute protuberance.

Cypripedium Drurii, Beddome, Icon. pl. ind. or. p. 23 t. 112 (1874). Rchb. Xen. Orch. II. p. 223. Id. in Gard. Chron. VI. (1876). p. 68. *Illus. hort.* 1877, t. 265. *Fl. Mag.* n. s. t. 425.

This very distinct species was discovered in 1865 on the Travancore Hills, in the extreme south of India, at an elevation of 5,000—6,000 feet, by Colonel Drury, after whom it is named. Colonel Beddome subsequently found it "very abundant on the top of the Calcad Hills (Travancore) in flower in January"; it is, therefore, in a geographical sense one of the most isolated of all the coriaceous Cypripedes, no other species being known to occur within many hundred miles of this station. It was introduced to European gardens by the last-named officer, who sent plants to the Royal Gardens at Kew about the year 1875; it usually flowers in the orchid-houses of this country in March and April, but occasionally earlier. The black median bands on the sepals and petals form a striking characteristic of this interesting species.

C. Elliottianum.

"Leaves bright green, 12—15 inches long and 1½—2 inches broad. Scapes stout, purple dotted, over 1 foot in height, 2—5 flowered. Bracts spathaceous, 1—1½ inches long, whitish with narrow chocolate lines. Upper sepal 1½ inch wide and 2½ inches long, pointed, ivory-white, with fifteen dark crimson lines of various lengths; lower sepal similar but smaller; lip nearly like that of *Cypripedium Stonei* in colour and shape, ivory-white, delicately veined and tinted with rose; petals white, spotted on the basilar portion with crimson blotches, which run into three or four narrow lines to the points; undulate and ciliate as in *C. Sanderianum.* Staminode narrow and beak-like, as in *C. Rothschildianum.*"—James O'Brien, in Gard. Chron. IV. s. 3 (1888), p. 501.

Cypripedium Elliottianum, James O'Brien, loc. cit. Rchb. in Gard. Chron. IV. s. 3 (1888), p. 532.

This is a new Cypripede brought under notice by Messrs. Sander and Co., of St. Albans, while these pages are passing through the press. It is said to be a native of the Philippine Islands, and is "dedicated to Mr. Elliott, of the firm of Messrs. Young and Elliott, of New York."

C. Fairieanum.

Plant dwarf and compact. Leaves oblong-ligulate, acute, 4—6 inches long, of a uniform bright green. Scapes somewhat slender, pale green, 4—6 inches high, one-flowered. Bract less than half the length of the brown-purple ovary. Flowers 2½—3 inches across vertically; upper sepal cordate-oblong, ciliate, undulate at the margin, reflexed at the apex, with a hairy keel behind, white with a pale yellow-green stain at the base, and with purple longitudinal and anastomosing veins; lower sepal smaller, ovate, ciliate, pale green streaked with purple; petals oblong-ligulate, "deflexed and recurved like a buffalo's horn," fringed at the undulate margin with minute blackish hairs, yellow-white with longitudinal streaks and marginal bands of purple; lip calceiform, brownish green with purplish reticulation, the infolded lobes narrow, cream-white spotted with purple. Staminode orbicular-lunate, with a proboscis between the horns of the crescent, ivory-white mottled with green, and with a purple band along the front.

Cypripedium Fairieanum, Lindl. in Gard. Chron. 1857, p. 740. *Bot. Mag.* t. 5024. Van Houtte's *Fl. des Serres, XII.* t. 1244. Rchb. *Xen. Orch. II.* p. 108, t. 133. Williams' *Orch. Alb. II.* t. 70 (Fairrieanum).

Cypripedium Fairieanum was first brought under notice in 1857, when flowers were sent to Sir William J. Hooker at Kew from the garden of Mr. Reid, of Burnham, Somerset, and from the nursery of Mr. Parker, at Upper Holloway. In October of the same year a plant in flower was exhibited at a meeting of the Horticultural Society of London, held at Willis's Rooms, by Mr. Fairie, of Aigburth, near Liverpool, to whom Dr. Lindley dedicated the species in a description published shortly afterwards in the *Gardeners' Chronicle*. All these plants are believed to have been obtained at a sale at Stevens' Rooms of a collection of East Indian orchids sent from Assam;* beyond this, nothing whatever is known of its origin; it does not appear to have been met with in its native country since that time, a circumstance that would seem to imply not only a very restricted habitat, but also a very remote or inaccessible station.

This Cypripede has therefore always been a rare plant, and one of the highest interest to orchid amateurs; it is, moreover, one of the most beautiful of its race, and we can imagine no one who has once seen it who would not endorse the opinion of Sir William J. Hooker that "the blossoms are certainly amongst the most exquisitely coloured and pencilled of any in this fine genus."†

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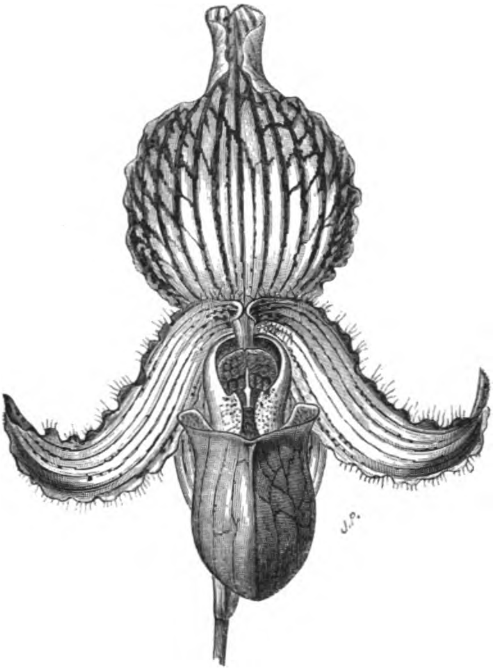
* The late M. Van Houtte, in his *Flore des Serres*, sub. t. 1244, stated that "Le *Cypripedium Fairieanum* nous est venu sans nom du Bhotan et c'est sous le No. 783 que nous l'avons livré à quelques-uns de nos correspondants."

† Bot. Mag. sub. t. 5024.

Cultural Note.—Many cultivators of orchids have complained that *Cypripedium Fairieanum* is a difficult subject to induce to grow satisfactorily. We are inclined to believe that at least one cause of failure is to be found in the stress to which plants have been subjected for the sake of propagation, combined, perhaps, with the too high temperature in which weakly plants have been placed, with the view of inducing rapid growth. It is certain that this Cypripede does not thrive in a high temperature and close atmosphere, but if suspended near the roof glass of the Cattleya or intermediate house, where it can receive the greatest amount of fresh air and light the circumstances of the house admit of, satisfactory results may with confidence be expected. In evidence of this, we can adduce no better instance than the splendid specimen in the collection of Baron Schröeder, at The Dell, near Staines.



Cypripedium Fairieanum.

C. glanduliferum.

Leaves equitant, ligulate, obtuse, 18—24 inches long, prominently keeled beneath, leathery, and of a uniform deep green. Scapes 15—20 or more inches long, blackish purple, partially mottled with green and clothed with greyish brown hairs. Bract 1—1½ inches long, acutely keeled, brownish with deeper veins. Flowers 5 inches across vertically; upper sepal broadly ovate, acute, keeled behind, cream-white, yellowish in the centre, the longitudinal veins red-brown; lower sepal similar and subequal; petals linear, ribbon-like, depressed, twisted, 4—5 inches long, yellow-green with red-brown longitudinal veins, and with 8—10 prominent, bearded warts on each margin towards the base; lip calceiform, pale yellow with red-brown anastomosing veins. Staminode sub-quadrate, with a small sinus in the front margin, buff-yellow, the broadly inflexed lateral margins studded with short red-brown bristles.

Cypripedium glanduliferum, Blume, *Rumph. IV.* p. 56, t. 195, fig. 2 and t. 198 (1848). Rchb. in Walp. Ann. III. p. 602 (1852-53). C. præstans, Rchb. in Gard. Chron. XXVI. (1886), p. 776. Id. II. s. 3 (1887), p. 814, icon. xyl. Illus. hort. 1887, p. 35.

This remarkable species was first described and figured by the Dutch botanist Blume more than forty years ago from materials supplied to him by Zippel, one of the earlier explorers of western New Guinea and adjacent region, in *Rumphia,* an elaborate and beautifully illustrated work on Indian and Malayan plants not previously known. Nothing more was seen or heard of it till it was re-discovered in 1886 by the Lindenian collectors in Dutch Malaya, who sent living plants to Europe towards the end of that year; the consignment, however, was subjected to much delay *en route,* and reached its destination during a severe frost, and in consequence, few plants were saved; another consignment arrived in better condition in May following. One of the plants of the first consignment flowered in June in the horticultural establishment (Societé anonyme), at the Parc Leopold, Brussels, and subsequently others flowered in British collections,* when the distinct character of the species and its great merit as a horticultural plant were recognised. The specific name *glanduliferum,* "gland-bearing," refers to the glandular warts along the margin of the basal portion of the petals.

C. Godefroyæ.

Leaves linear-oblong, 3—5 inches long, deep green, more or less marbled and spotted with pale green above, densely spotted with brown-purple beneath. Scapes 1—3 inches high, pale green spotted with purple, tomentose, 1—2 flowered. Bract one-third as long as the ovary. Flowers 2—2½ inches across vertically, French-white, sometimes pale yellow, spotted with magenta-purple and obscurely pubescent; upper sepal broadly ovate or sub-orbicular, keeled behind; lower sepal elliptic-oblong, much smaller; petals elliptic-oblong, broad and deflexed as in *Cypripedium concolor;* lip sub-cylindric, minutely spotted. Staminode roundish-oblong, minutely spotted like the lip, and with a yellowish stain in the centre.

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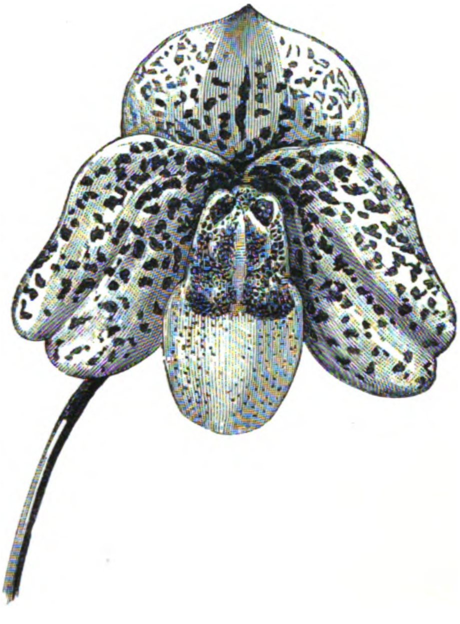
* After carefully comparing the flowers that expanded in one of these collections with Blume's elaborate and unquestionably accurate description of *Cypripedium glanduliferum* in *Rumphia,* we are satisfied that the Cypripedium in cultivation, under the name of *C. præstans* (Rchb.), must be referred to the first-named.

Cypripedium Godefroyæ, Orchidophile 1883, p. 830, icon. xyl. Fl. and Pomol. 1884, p. 37. *The Garden, XXVII.* (1885), t. 492. Williams' *Orch. Alb. IV.* t. 177. Gard. Chron. XXIII. (1885), p. 49, icon. xyl. *Bot. Mag.* t. 6876.



Cypripedium Godefroyæ.

The merit of introducing this beautiful Cypripede is due to M. Godefroy, of Argenteuil, near Paris, to whom it became known in 1876 while at Singapore, on his return home from Cochin China. It had been discovered a short time previously by an Englishman named Murton, formerly an employé in the Royal Gardens at Kew, of whom M. Godefroy purchased the plants he had collected. Murton, however, died before the plants were despatched to Europe, leaving them to the care of another Englishman named Alabaster, at that time in charge of the public gardens at Bangkok, but he falling ill, they all perished. Alabaster subsequently procured more plants, which he forwarded to M. Godefroy, and at the same time, or shortly afterwards, he sent some plants to Kew. All these were collected "on the cliff of a limestone island near the Bird's-Nest Islands of Champon; they grow facing the mainland west, and none on the east side of the island; some were gathered 16 feet above sea-level, others were seen at 80 feet above sea-level, and at intermediate heights."* In this situation the plants are in the shade till about 10 a.m., from which hour till sunset they are fully exposed to the glare of a tropical sun, the difference between the extreme day and night temperature being very considerable.† As stated under *Cypripedium concolor*, *C. Godefroyæ* is intermediate between *C. concolor* and *C. niveum*, and specifically unites them. As a horticultural plant it is a beautiful acquisition; it has proved to be a very variable plant, especially in the foliage, in the size of the flowers, and in the spotting of their segments.

C. Haynaldianum.

Leaves ligulate, leathery, 10—15 inches long, 1½—2 inches broad, bidentate at the tip. Scapes 20—30 inches long, 5—6 flowered. Bract half as long as the ovary. Flowers large, with spreading segments; upper sepal oval, obtuse, folded at the mid-vein, the lower half with revolute margins, upper half whitish faintly tinted with rose, basal half pale yellowish green with large brown spots along the veins; lower sepal broadly ovate, whitish with pale green veins; petals linear-spathulate, 3—4 inches long, ciliate, twisted beyond the middle and recurved at the apex, the basal half yellowish green with 8—12 large brown spots that are chiefly marginal, the distal half pale dull purple; lip helmet-shaped, pale green tinged with dull purple, the infolded lobes yellowish. Staminode oblong, with a tooth at the base, bilobed on the front side.

Cypripedium Haynaldianum, Rchb. Xen. Orch. II. p. 222 (1874). *Id. III.* p. 33, t. 212. Gard. Chron. VII. (1877), p. 272. *Bot. Mag.* t. 6296.

Introduced by us, in 1873, from the Philippine Islands, through M. Gustav Wallis, who had discovered it at San Isidro, near Manila. It is dedicated to Cardinal Haynald, Archbishop of Kaloesa, in Hungary, "a zealous botanist and an active promoter of science and art, and whose name will ever be honourably connected with the development of Hungary."

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* The Garden, XXVII. (1885), p. 342.

† Godefroy's Orchidophile, 1883, p. 330.

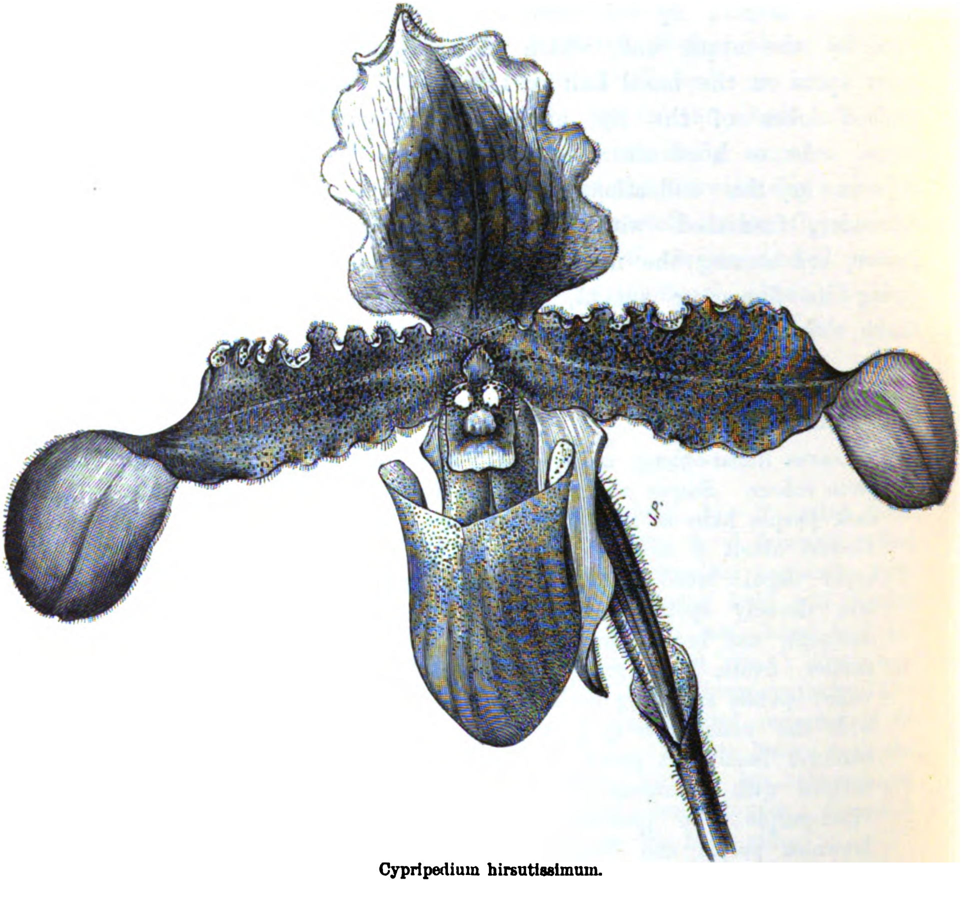
As a species *Cypripedium Haynaldianum* is comparable with *C. Lowii,* for which it might be mistaken on superficial glance, but from which it is distinguished chiefly by its longer (nearly oblong) differently coloured staminode, the tooth at the base of which is less prominent and destitute of the hairy appendage it has in *C. Lowii;* by its broader and differently coloured sepals, especially the upper one, which is conspicuously spotted; by the larger spots on the basal half of the petals; by the more prominent infolded lobes of the lip, and by its larger and more leathery leaves. As a horticultural plant it forms noble specimens which, as seen in the collections of Sir Trevor Lawrence and Baron Schroeder, furnished with numerous scapes, each bearing 5—6 flowers, are among the most striking objects in the orchid house during its flowering season, which is usually from January to March.

C. hirsutissimum.

Leaves linear-oblong, acute, 9—12 or more inches long, of a uniform green colour. Scapes about a foot high, usually green, and clothed with dark purple hairs as are the small bract, ovary, and back of the flower. Flowers about 4 inches across vertically, with all the segments ciliated; upper sepal broadly cordate, keeled behind, the central and basal area densely spotted with blackish purple, the spots being often confluent, the broad marginal area deeper or paler green; lower sepal smaller, ovate, pale green with some purplish markings along the veins; petals spreading horizontally, broadly spathulate, slightly twisted, with the margins crisped and undulated along the basal half, the narrower basal part green blotched and spotted with deep purple and studded with numerous blackish hairs, the dilated apical part bright violet-purple; lip prominent, helmet-shaped, dull green stained with brownish purple and dotted with minute blackish warts. Staminode nearly square, green with two white spots near the basal edge.

Cypripedium hirsutissimum, Lindl. MS. *fide* Hook. *Bot. Mag.* t. 4990 (1857). Warner's *Sel. Orch. I.* t. 15 (1862—65). Belg. hort. VII. p. 353 (1857). Illus. hort. IV. misc. 67. Rchb. *Xen. Orch. II.* p. 107, t. 132. Van Houtte's *Fl. des Serres, XIV.* t. 1430 (1861).

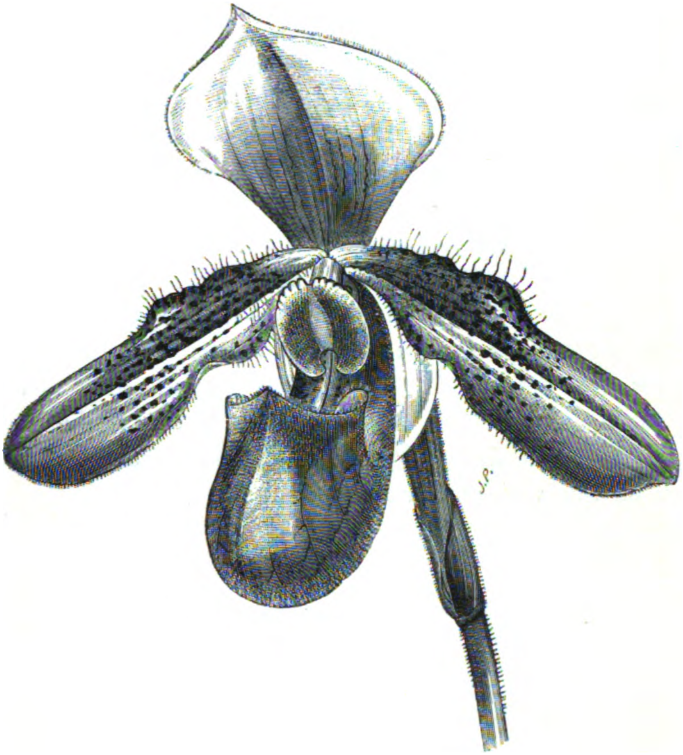
Cypripedium hirsutissimum and *C. Fairieanum,* two of the most remarkable Indian Cypripedes, were introduced to British gardens about the year 1857, but nothing whatever was then known of their origin further than they had been sent to England by a collector named Simons. The precise station of *C. Fairieanum* is still a mystery, while that of *C. hirsutissimum* remained unknown till 1868—69, about which time the late Mr. John Day received a few plants from his nephew Captain Williamson, who had gathered them on the Assam side of the Khasia Hills, whence it has since been received by horticultural firms; it flowered for the first time in this country in Mr. Parker's nursery at Upper Holloway, shortly after its introduction. The usual flowering season of *C. hirsutissimum* is from March to May; the specific name, meaning "very hairy," refers to the shaggy character of the inflorescence.



Cypripedium hirsutissimum.

C. Hookeræ.

Leaves elliptic-oblong, 4—6 inches long and 1½—2 inches broad, deep green, mottled with light greyish green. Scapes somewhat slender and elongated, one- (rarely two-) flowered, clothed with greyish hairs as is the ovary. Bract about one-half the length of the ovary. Flowers medium size, 2½ inches across vertically, with all the segments ciliolate; upper sepal cordate, acute, yellowish white with green centre, keeled and hairy behind; lower sepal smaller, ovate, pale yellow-green; petals spathulate, depressed, the narrower basal part undulate, green with blackish spots and purple margin, the dilated distal part purple; lip helmet-shaped, brownish purple toned with green, the infolded lobes yellowish brown spotted with red-purple. Staminode large for the size of the flower, broadly oval with a rounded notch on the apical side, brown-purple with a pale yellow-green centre and margin.



Cypripedium Hookeræ.

Cypripedium Hookeræ, Rchb. *fide Bot. Mag.* t. 5362 (1863). Van Houtte's *Fl. des Serres XV.* t. 1565 (copied from the Bot. Mag.). Rchb. *Xen. Orch. II.* p. 125, t. 141. C. barbatum Hookeræ, Gartenfl. XXVI. p. 245 (1876).

var.—Bullenianum.

Leaves duller in colour and less distinctly mottled. Flowers somewhat smaller and appearing earlier in the year; upper sepal with some blackish streaks at the base; petals with 3—4 small blackish warts on each margin, and with the dilated apical portion edged with pale yellow-green.

C. Hookeræ Bullenianum, supra. C. Bullenianum, Rchb. in Bot. Zeit. 1865, p. 99. Id. Gard. Chron. XV. (1881), p. 563 (oculatum) XXI. (1884), p. 174 (anophthalmum).

Discovered by Sir Hugh Low in North Borneo, in 1862, and introduced shortly afterwards by Messrs. Low and Co., of the Clapton Nurseries; it was subsequently gathered by one of our own collectors, in Saràwak, on limestone hills, at 1,000—1,500 feet elevation, growing with *Cypripedium Stonei.* It is dedicated to Lady Hooker, wife of the late Sir William Jackson Hooker, for many years the distinguished Director of the Royal Gardens at Kew. The variety *Bullenianum* appeared amongst an importation of *C. Hookeræ* by Messrs. Low and Co. in 1864-5, and is named after Mr. Bullen, at that time one of their foremen, but now of the Lewisham Nurseries. The usual flowering season of the species is May and June, that of the variety March and April.

C. insigne.

Leaves linear-ligulate, acute, 8—12 inches long, of a uniform pallid green. Scapes about a foot high, one- (rarely two-) flowered. Bract compressed, as long as the ovary. Flowers with a glossy varnished surface 4—5 inches across vertically; upper sepal broadly oval, with the lateral margins slightly revolute, and the apical one bent forwards, the central and basal area apple-green with numerous brownish purple spots arranged with greater or less regularity along the longitudinal green veins, the apical area white; lower sepal smaller, ovate, acute, pale green; petals spreading, linear-oblong, with undulate margins, pale yellowish green with brownish purple longitudinal veins; lip helmet-shaped, yellowish green shaded with brown, the infolded lobes deep tawny yellow with paler margin. Staminode subquadrate, pubescent, with an orange-yellow tubercle in the centre.

Cypripedium insigne, Wallich. MS. Lindl. *Collect. Bot.* t. 32 (1821—24). Id. Gen. et. Sp. Orch. p. 530. *Bot. Mag.* t. 3412. Williams' *Orch. Alb. IV.* t. 155.

var.—Chantinii.

Flowers equal in size to those of the type, but with the segments less undulate and differently coloured; upper sepal bent forwards and folded at the apex, the broad white margin extending nearly half-way down and prolonged laterally to near the base, the spots on the white area being of a beautiful mauve purple; the lower sepal longer, more acute, and often with a whitish tip; the petals and lip with a more glossy surface, the former with deep amber veins, and the latter bright chestnut-brown, the pouch of the lip broader at the aperture.

C. insigne Chantinii, Rafarin in Rev. hort. 1866, p. 249. Id. 1878, p. 136, icon. xyl. Godefroy's *Orchidophile*, 1885, p. 36. C. insigne punctatum violaceum, Hort. Henderson, 1869, *fide* The Gardener, 1882, p. 58. *The Garden, XXI.* (1882), p. 444, t. 342. Gard. Chron. XVIII. (1882), p. 717, icon xyl. Williams' *Orch. Alb. VI.* t. 278. C. insigne Veitchianum, Van Houtte's Fl. des Serres, XXI. p. 72 (1875).

var.—Maulei.

Compared with the preceding variety the flowers are somewhat larger; the dorsal sepal more arching, with the lateral margins revolute towards the base, and with the broad white margin confined to the apical half; the petals somewhat more undulated, and paler in colour; the sac of the lip narrower and longer, and of a lighter colour.

C. insigne Maulei, Moore in *Fl. Mag.* 1861, t. 57. Van Houtte's *Fl. des Serres, XV.* t. 1564. *The Garden, XXI.* (1882), p. 444, t. 342. Gard. Chron. XVIII. (1882), p. 716, icon. xyl.

var.—Sanderæ.

Flowers of a delicate primrose-yellow with the exception of the broad white apical margin which is here very pure, and the buff-yellow staminode which is paler than in the type. There are a few brown dots on the central veins of the upper sepal; in the petals and lip the venation is almost obliterated.

C. insigne Sanderæ, Hort. Sander.

sub-vars.—*albo-marginatum* (Williams' *Orch. Alb. V.* t. 232); *aspersum;** *aureum* (Fl. and Pomol. 1882, p. 75)*; Cambridge Lodge; fuscatum; Mr. Kimball's;* Mr. Tautz's; nobile; Mr. Moore's; maculatum; maximum; pulcherrimum; rubro-maculatum;* Studley House,* etc., etc.

Cypripedium insigne was discovered by Dr. Wallich in the Sylhet district of north-east India, some time during the second decade of the present century, and was sent by him to England about the year 1819—20; it flowered for the first time in this country in the Liverpool Botanic Garden in the autumn of 1820; it was subsequently discovered by Griffith and other botanical explorers on the Khasia Hills. *C. insigne* was the second species of coriaceous Cypripedium introduced into European gardens, it having been preceded, by a few months only, by *C. venustum,* and it is a curious fact in the horticultural history of the genus that these two remained the only species of their section known to cultivation for twenty years following their introduction. The variety *Chantinii* originated from two sources; its first recorded appearance was amongst a number of imported plants acquired from us by M. Chantin, a nurseryman of Paris, who sold it to M. Bertrand, an amateur at Queue-en-Brie. M. Bertrand afterwards parted with it to the Etablissement de La Muette (Le Fleuriste de Paris) in exchange for other plants, and in 1866 it was described by M. Rafarin, the Director of that establishment, in the *Revue horticole*, *loc. cit. supra*. Its second appearance, probably the first time in chronological order of introduction, was amongst a small importation of the species by Messrs. Henderson and Son in 1855, but it was not till 1869 that the propagation was sufficiently advanced to admit of a limited number of plants being distributed, the plants so distributed being sold under the name of *C. insigne* var. *punctatum violaceum*.* The variety *Maulei* was imported by Messrs. Maule and Sons, of Bristol, three or four years prior to 1860, in which year it flowered for the first time in their Stapleton Road Nurseries. The two varieties, as we have above described and compared them, are seminal; they are quite distinct and not likely to be confounded with each other, but there are also in cultivation forms so well-nigh intermediate between them that it is indeed hard to say to which of the two varieties they should be referred. The variety *Sanderæ* is one of the most distinct and beautiful of the *insigne* forms yet seen; so far as at present known it is represented by a single plant which has been acquired by Baron Schröeder, of The Dell, Staines. The sub-varieties, which differ in colour only from the type, are in some cases evidently due to the influence of cultivation, and may continue to appear indefinitely in a species so generally cultivated as *C. insigne*; others are probably seminal or introduced forms. Of those that have received names for garden use, *aureum*, *albo-marginatum*, *Cambridge Lodge*, and *Mr. Tautz's* are the most distinct and attractive we have yet seen.

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* Those marked * are known to us only from drawings kindly sent for our inspection by Mr. W. S. Kimball, of Rochester, U.S.A., who possesses one of the most complete collections of *Cypripedium insigne* variations known. A full page woodcut of these in full bloom is given in the *Gardeners' Chronicle* for May 5th, 1888.

Cultural Note.—Cypripedium insigne is one of the most useful horticultural plants ever introduced, and at the same time one of the easiest to cultivate. "In a window, or in a well-lighted sitting-room it is perfectly at home, and with proper attention as to watering and sprinkling occasionally to rid the leaves of dust, increases in size, and flowers regularly every winter. A light and airy greenhouse from which frost is excluded, suits it admirably; it may be kept even in a cold frame during the summer months. It is not particular as to compost; it will grow in loam, peat, common garden soil, peat-fibre and bone dust, peat-loam and sand, loam and dried cow-manure, peat-fibre and horse-droppings, sphagnum moss and charcoal, and finally cocoa-nut fibre, surfaced with growing *Selaginella Krausiana.* It is most vigorous in constitution, and so defies all bad and indifferent culture, growing even under no special culture of any kind." * As a plant in universal request it is often grown in a vinery when such accommodation is at hand. The best time to divide and repot *C. insigne* is immediately after flowering; in making the division the roots should be carefully unravelled, and in re-potting plenty of drainage should be given.

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* F. W. Burbidge, in The Garden, XXI. (1882), p. 444.

C. javanicum.

Leaves elliptic-oblong, 6—8 inches long, greyish green above, somewhat sparingly mottled with deep green, but sometimes deeper and with more spots. Scapes mottled pale green and crimson, one- (rarely two-) flowered. Bract about one-third as long as the ovary. Flowers 3 inches across vertically, with all the segments ciliolate except the labellum; upper sepal cordate, acuminate, pale green with deep green veins, whitish towards the apex; lower sepal ovate-oblong, smaller; petals broadly ligulate, slightly deflexed, pale green dotted with minute blackish warts to two-thirds of their length, the distal third pale dull purple and destitute of warts; lip sub-cylindric, brownish green, pale green beneath, the infolded lobes almost meeting at their edges, pale green spotted with purple. Staminode broadly reniform, with a notch in the basal, and a shallow sinus in the apical side.

Cypripedium javanicum, Rwdt. Bl. Hort. Buitenz. 98 (1823), name only. Lindl. in Paxt. Fl. Gard. I. p. 38 (1850—51). Van Houtte's *Fl. des Serres, VII.* t. 703 (1851). Bl. *Orch. de l'Archipel. Ind. et Jap.* p. 167, t. 58 (1858).

var.—virens.

Flowers somewhat smaller, in which the prevailing green colour is deeper and brighter; the petals spreading, reflexed beyond the middle; the surface of the lip more glossy and of a deeper brown.

C. javanicum virens, supra. C. virens, Rchb. in Bot. Zeit. 1863, p. 128. Id. *Xen. Orch. II.* p. 154, t. 162 (1870).

The species was discovered by the Dutch botanist Reinwardt, in 1826, on the mountains of eastern Java, at 3,000—4,000 feet elevation. According to Blume,† the flowers are somewhat variable in colour, especially the infolded lobes of the labellum, which are sometimes purplish. It was not introduced into European gardens till 1840, when Thomas Lobb sent plants to the Exeter Nursery.

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* F. W. Burbidge, in The Garden, XXI. (1882), p. 445.

† Orch. de l'Archipel. Ind. et Jap. p. 167.

The variety occurred as a single plant among an importation of Cypripedes from North Borneo, in 1858, by Messrs. Low and Co., from whom it was acquired shortly afterwards by the late Mr. John Day. There is no record of its having been imported since.

C. Lawrenceanum.

Leaves oval-oblong, 6—9 inches long and 2—2½ inches broad, tesselated with yellowish green and deep grass-green. Scapes 15—18 inches high, one- (sometimes two-) flowered. Bract small, embracing not more than one-fourth of the ovary. Flowers 4—5 inches across vertically; upper sepal large, nearly orbicular, folded at the middle, white, with broad alternately longer and shorter veins, the central ones usually green at the base, the others deep vinous purple; lower sepal ovate-oblong, much smaller; petals straight, ligulate, ciliolate, with 5—10 blackish warts on each margin, green with purplish tips; lip pouch-like, much inflated, dull purple, tinged with brown above, green beneath. Staminode "lunate with acute incurved cusps and five teeth in the sinus, and with a deep cleft at the back."

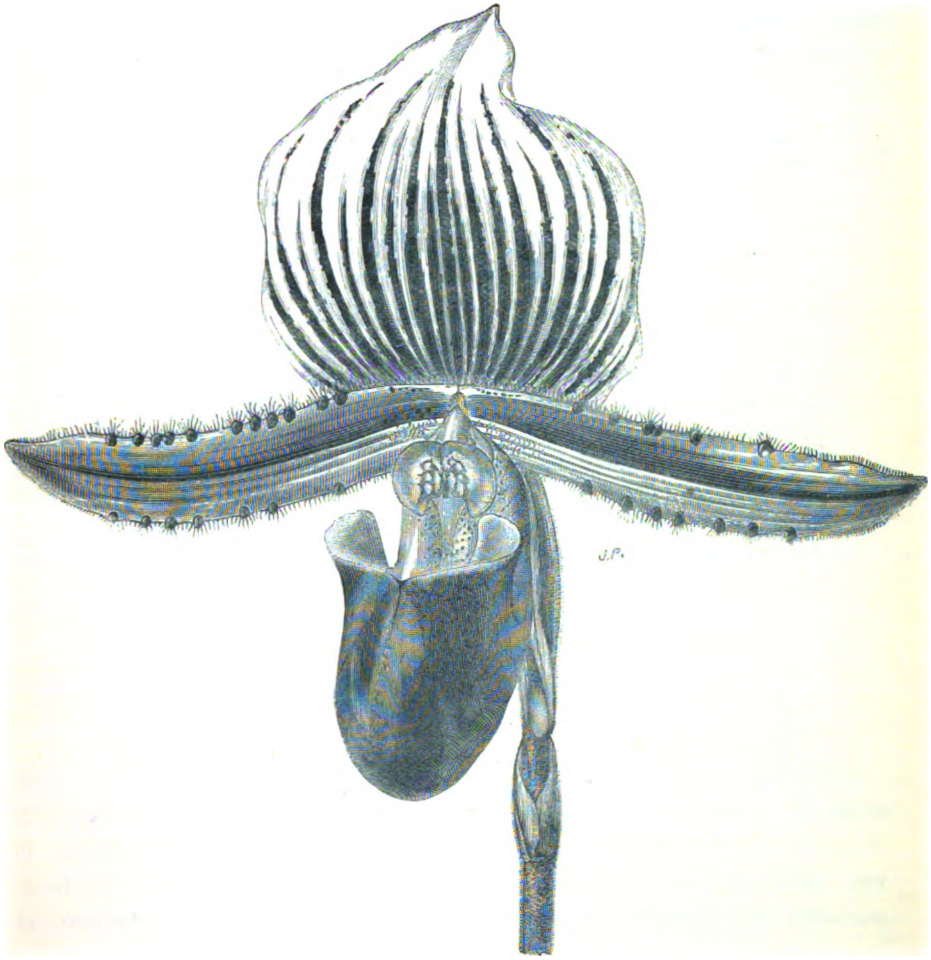
Cypripedium Lawrenceanum, Rchb. in Gard. Chron. X. (1878), p. 748. *Bot. Mag.* t. 6432. Van Houtte's *Fl. des Serres XXIII.* t. 2372. Williams' *Orch. Alb. I.* t. 22. *Illus. hort. XXX.* t. 478 (1883). Belg. hort. XXX. p. 128 (1880).

var.—Hyeanum.

Upper sepal of the purest white, with bright grass-green veins; petals yellowish green with deep green veins; lip also of the brightest green, with deep green veins and reticulations.

C. Lawrenceanum Hyeanum, Rchb. in Gard. Chron. XXV. (1886), p. 680.

Cypripedium Lawrenceanum was discovered by Mr. F. W. Burbidge, in 1878, during his mission for us to North Borneo. It occurs on the left bank of the Lawas River, near Meringit, at an altitude of 1,000—1,500 feet, growing in company with the beautiful little dwarf palm named *Pinanga Veitchii.* In this locality the Cypripede is found chiefly in the shady forest, growing in the layer of dead leaves and other forest *débris* that overlie a substratum of yellow clay; less frequently it occurs among moss and leaves on limestone rocks. Amongst recent importations several sub-varieties of great merit have appeared, especially the remarkable *albino* form described above, in which all traces of the purple so conspicuous in the veins of the upper sepal and in other parts of the flower have entirely disappeared; this form is regarded by amateurs as one of the handsomest of all Cypripedes; it is named in compliment to M. Hye-Leysen, of Ghent. Other sub-varieties are distinguished by the prominence and rich colour of the veins of the upper sepal, which is sometimes diffused over the greater part of the surface; a form in Mr. R. I. Measures' collection at Cambridge Lodge, Camberwell, has the sepals and petals incurved instead of spreading; another in Mr. F. G. Tautz's collection at Studley House, Ham-



Cypripedium Lawrenceanum.

mersmith, has warts along the veins of the upper sepal.* The influence of cultivation has been chiefly manifested in the development of the enormous upper sepal, and in the heightening of the colour of the beautifully tesselated foliage.

This fine species is worthily dedicated to Sir Trevor Lawrence, Bart., President of the Royal Horticultural Society; its normal flowering season is from the beginning of April to the end of May.

C. Lowii.

Leaves ligulate, 9—15 inches long, equitant at base, mucronate or obscurely two-lobed at apex, leathery, grass-green. Scapes 25—40 inches long, nodding, 3—5 (rarely more) flowered. Bract not more than one-third the length of the ovary. Flowers with all the segments ciliolate, 3—4 inches across vertically; upper sepal broadly oval, acute, bent forward at the apex, the sides revolute at the base, pubescent and keeled behind, yellowish green changing with age to pale yellow, the basal area veined with brownish purple; lower sepal similar but smaller, yellowish with green veins; petals 3 inches long, spathulate, twisted, deflexed, the narrower basal part yellow with black circular, scattered spots, some of which are ocellated, the dilated distal part light violet-purple; lip cylindric-galeate, brown, paler beneath, the narrow infolded lobes yellowish, the sinus between the sac and infolded lobes three-toothed. Staminode obcordate, bordered with purple hairs, and having a small erect horn at the base that is hairy behind, and a blunt tooth in the sinus of the apical edge.

Cypripedium Lowii (*lapsu calami* Lowei), Lindl. in Gard. Chron. 1847, p. 765. Van Houtte's *Fl. des Serres, IV.* t. 375 (1848). De Puydt *Les Orch.* t. 11. Fl. and Pomol. 1870, p. 108, icon. xyl. C. cruciforme, Zoll. et Mir. in De Vriese et Pahud. *Illus. d'Orch.* 1854.

Discovered in Saràwak, in North-west Borneo, "growing on high trees in thick jungle, and flowering in April and May," by Sir Hugh Low, to whom the species is dedicated and by whom it was sent to the Clapton Nurseries in 1846. It has since been gathered by our own collectors in the same settlement, where it occurs almost invariably in the forks of the branches of trees, often at a great height from the ground. It flowered for the first time in this country in the collection of Mr. A. Kenrick, of West Bromwich, shortly after its introduction.

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* The variability of *Cypripedium Lawrenceanum* is, however, chiefly noticeable in the veins of the upper sepal; these are sometimes narrow and close set; sometimes distant, and then broad and prominent; sometimes alternately green and purple; sometimes all purple, etc., etc.

C. Mastersianum.

Leaves oblong or oval-oblong, acute, 8—10 inches long, deep green with pale green tesselations. Scapes 12—15 inches high, deep purple, very hairy, one-flowered; bract short. Flowers 3 inches across vertically; upper sepal sub-orbicular with ciliolate margin, bright green with a broad yellow-white border, and deep green veins; lower sepal ovate, acute, much smaller, pale green; petals spreading horizontally, spathulate with ciliolate margins, brownish red, paler towards the base where there are numerous small black-purple warts along the superior margin and along the mid-vein; lip sub-cylindric much inflated, pale reddish brown, the infolded lobes greenish brown spotted with dull purple. Staminode horseshoe-shaped, with acute incurved cusps on the apical side.

Cypripedium Mastersianum, Rchb. in Gard. Chron. XII. (1879), p. 102.

We find nothing recorded of the habitat of this very distinct Cypripede beyond the statement that it is of "Sundaic origin," and although Professor Reichenbach adds that he was indebted to us for the materials for description, the plant was not imported by us, but was received from the Royal Gardens at Kew. It is named in compliment to Dr. Maxwell T. Masters, F.R.S., the genial and accomplished editor of the *Gardeners' Chronicle.*

C. niveum.

Leaves oblong, 4—6 inches long, dark dull green above, with greyish green spots, deep lurid purple beneath. Scapes erect, 6—8 inches high, 1—2 flowered, with two small downy bracts sheathing the base of the ovary, of which the posterior one is the largest. Flowers 3 inches across, white, more or less dotted with purple towards the base of the upper sepal and petals;* sepals and petals ciliolate, the dorsal sepal orbicular, pointed, concave in front, keeled and stained with reddish purple behind, the lower sepal ovate-oblong, much smaller; petals spreading, slightly deflexed, broadly oblong, obtuse, but sometimes nearly sub-orbicular; lip ovoid, with a contracted mouth. Staminode sub-reniform tending to oblong, yellow bordered with white.

Cypripedium niveum, Rchb. in Gard. Chron. 1869, p. 1038. Id. Xen. Orch. II. p. 155 (1870). *Bot. Mag.* t. 5922 (1871). *Illus. hort. XVIII.* t. 83 (1871). *Fl. Mag.* 1871, t. 543. Jennings' *Orch.* t. 28. Gard. Chron. XIX. (1883), p. 16, 19 icon. xyl. Sander's *Reichenbachia I.* t. 34. *The Garden IX.* (1876), t. 23. C. concolor niveum, Rchb. in Gard. Chron. loc. cit.

The first appearance of *Cypripedium niveum* in this country was an agreeable surprise. In 1868 we received from Moulmein a consignment of plants of a Cypripedium supposed to be *C. concolor*, but which, on flowering in the spring of the following year, proved to be the beautiful species described above. Its first discoverer is said to have been a Mr. d'Almeida.* As there is no evidence of *C. niveum* being a native of Moulmein or its immediate neighbourhood, the plants sent to us by our correspondent were presumably collected in the Langkawi (Lancavi) Islands, situate some miles north of the British settlement of Penang, its nearest known station to Moulmein, and where it has been recently collected by Förstermann for Messrs. Sander and Co., of St. Albans.† In these islands it is found "growing on limestone mountains, generally on the western sides where it is not much exposed to the sun; often in the crevices of the sloping rocks, but seldom on the perpendicular escarpments like many other Cypripedes." As regards climatic conditions, the hottest months of the year are April and May, and the coolest months are December and January, when the temperature is often as low as 13° C (55° F.); the plants are then at rest; in other respects,

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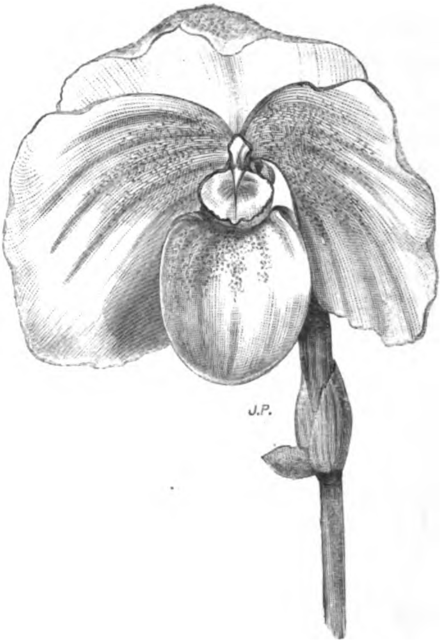
* The spotting is very variable; although generally confined to the basal half of the segments, it is sometimes more diffuse, rare instances have occurred in which the spots are arranged in lines along the veins of the dorsal sepal and petals.



Cypripedium niveum.

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[*] Sander's Reichenbachia I. p 75.

[†] Idem.

the climate of these islands is similar to that of the other small islands of the same region that are situate within the equatorial zone.

Not long after the first introduction of *Cypripedium niveum* by us, it was received by Mr. William Bull, from the Tambilan Islands,* a small group about midway between Singapore and Saràwak, whence it has since been again occasionally imported.

The specific name *niveum*, "snowy," refers to the pure white of the flowers; these are found to vary considerably in size and form, especially the petals, which in the Tambilan form are longer and narrower than in the Langkawi form.

Cultural Note.—The cultural requirements of *Cypripedium niveum* are precisely the same as those of *C. concolor.*

C. Parishii.

Leaves oblong-ligulate, 9—15 inches long and 1½—2½ inches broad, equitant at base, two-lobed or bifid at the apex, leathery, very smooth, bright glossy green. Scapes stoutish, sub-erect, pale green, downy, 4—7 flowered. Bracts ovate, acute, inflated, sheathing the ovaries to more than one-half their length Flowers 3 inches across vertically; upper sepal elliptic-oblong, acute, keeled at the back, the upper half bent forwards, the lateral margins revolute at the base, pale yellow with green veins; lower sepal similar but smaller, and with two keels; petals linear, twisted, 4—5 inches long, first spreading then quite pendulous, the basal half with undulate margins, green, with a few scattered blackish spots, the distal half blackish purple with a pale margin; lip calceiform, the infolded lobes narrow and smooth, deep green, often stained with brown-purple. Staminode obovate-oblong, with a sinus in the broader front edge and a prominent tooth at the base, pale yellow mottled with green on the disc.

Cypripedium Parishii, Rchb. in Flora, June, 1869. Gard. Chron. 1869, p. 814, with icon. xyl. and p. 1158. *Bot. Mag.* t. 5791. Williams' *Orch. Alb. II.* t. 86. *Illus. hort. XXII.* t. 214 (1875). Selenipedium Parishii, Rev. hort. 1885, p. 132.

The merit of the first discovery of this remarkable species is due to the Rev. C. Parish, who informs us that he detected it in the Moulmein district, in 1859, on trees growing in the decayed fibrous roots of *Drynaria quercifolia*, a very common fern in that region; behind the sessile fronds of this fern there is generally a thick mass of roots in various stages of decay which furnish the "nest" the plant seems to love; it has never been observed by its discoverer growing in any other places than on trees. It was rediscovered by him in 1866, when he brought some plants to his garden, one of which flowered in the following year; he made a drawing of this, which he sent with the dried inflorescence consisting of five open flowers to the Royal Gardens at Kew, where the species received the name it appropriately bears. Living plants were introduced for the first time by Messrs. Low and Co., in 1868.

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* Bot. Mag. sub. t. 5922.

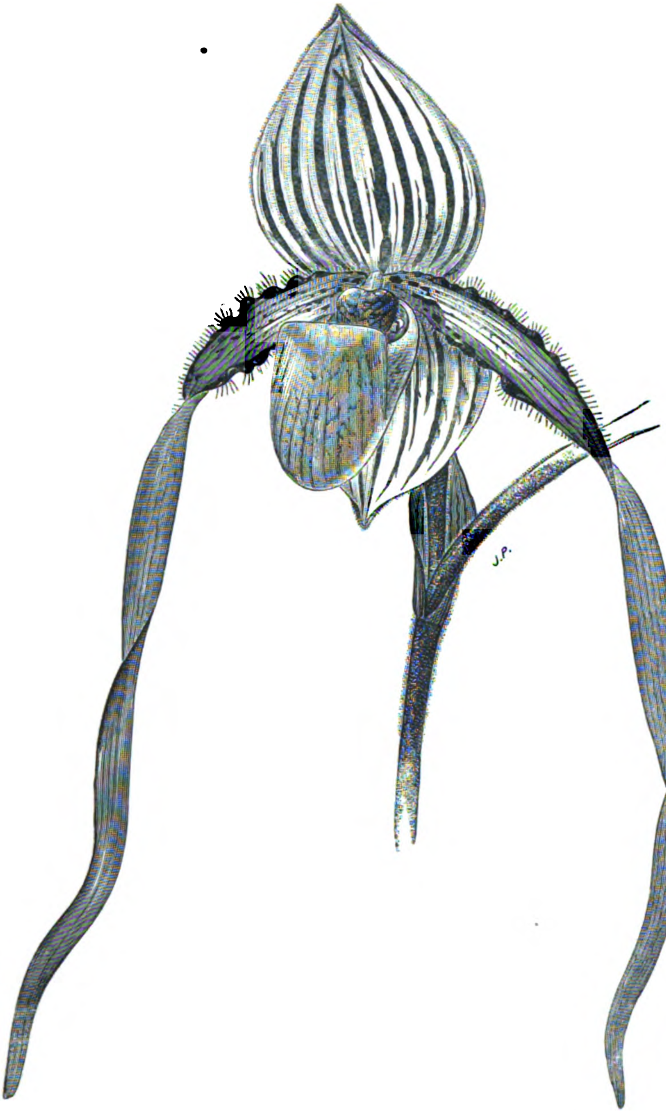
Cypripedium Parishii belongs to the sub-section of the genus that includes several noble species, all distinguished by their uniform green leaves, their 4—7-flowered scapes, their peculiarly-shaped staminode, by the placentas of the ovary nearly meeting, and by their long ribbon-like twisted petals that attain their greatest development in *C. Sanderianum.* The members of this sub-section, especially the last named, approach nearer to the South American Cypripedes than any other Asiatic species.

C. philippinense.

Leaves ligulate-oblong, 7—12 inches long, complicate at base, obtuse or unequally bilobed at apex, coriaceous with a polished glossy surface. Scapes 15—20 inches long, 3—5 or more flowered, the ovary of each flower sheathed to half its length by a boat-shaped reddish brown hairy bract. Flowers 3 inches across from tip to tip of upper and lower sepal; upper sepal broadly ovate, pointed, whitish, symmetrically striped with brown-purple; lower sepal similar, white with green veins; petals ribbon-like fringed with short hairs, pendulous, 5—6 inches long, twisted, yellowish at the base where there are some small hairy warts on both margins, and passing into dull reddish purple along the greater part of their length, pale green at the apex; lip helmet-shaped, buff-yellow faintly striated with brown, the infolded lobes narrow. Staminode sub-cordiform, emarginate, fringed with blackish hairs on each side.

Cypripedium philippinense, Rchb. in Bonpl. 1862, p. 335. C. lævigatum, Batem. in *Bot. Mag.* t. 5508 (1865). Id. in Gard. Chron. 1865, p. 914. *Fl. Mag.* 1866, t. 298. *Belg. hort.* 1867, p. 102, t. 6. Van Houtte's *Fl. des Serres*, *XVII.* t. 1760—61. C. Roebelenii (Röbbelenii), Rchb. in Gard. Chron. XX. (1883), p. 684.

This singular species was introduced from the Philippine Islands, in 1864, by the late Mr. John Gould Veitch, who had made a voyage to that distant part of the world with the object of obtaining, amongst other orchids, *Vanda Batemanii.* He had long searched in vain for this plant, "and had almost began to despair of ever meeting with it, when running his boat one day ashore on the south-west side of the small island of Guimares he found the rocks by the coast covered with huge masses of the plant of which he was in search, and at the same time he found this Cypripedium growing on its roots." It had, however, been made known to science three years before, when a description from a dried specimen was published in *Bonplandia* by Dr. Reichenbach, of which Mr. Bateman could not have been aware at the time of publishing the



Cypripedium philippinense.

species under the name of *lævigatum,* the name by which it is still best known in gardens; it has recently been introduced from another locality by Messrs. Sander and Co., through their collector Röbelen. It belongs to the sub-section of the genus which includes the species last described *(Cypripedium Parishii).* It flowered for the first time in this country in our Chelsea Nursery in March, 1865, but its normal flowering season is from two to three months later.

Cultural Note.—Cypripedium **philippinense** has its home in one of the hottest regions of the world, growing in the blaze of a tropical sun and exposed to the force of the monsoon storms, climatic conditions that are simply impossible in the glass structures of Europe. Nevertheless, the plant when once established will thrive and flower regularly in the lightest part of the Phalænopsis house, or in some such-like situation, where the highest temperature admitted in orchid culture is maintained.

C. purpuratum.

Leaves elliptic-oblong, 3—5 inches long, tesselated above with deep and pale green, the latter shade usually predominating. Scapes 5—7 inches high, one-flowered, the bract about two-thirds the length of the ovary. Flowers 3—3½ inches across vertically with the sepals and petals ciliolate; upper sepal sub-orbicular, cuspidate acute, folded at the mid-vein, the sides revolute at the base, white with a greenish stain in the centre and with 8—10 symmetrically curved brown-purple stripes; lower sepal ovate, acuminate, about one-third as large as the upper one, greenish; petals sub-spathulate, spreading, wavy, purplish crimson with sometimes deep purple, sometimes green veins, and with numerous small blackish warts towards the base; lip sub-cylindric, brownish purple with deeper veins and reticulations, the infolded lobes purple with numerous small warts. Staminode semi-lunate, with a notch behind and a small central tooth in front, dull green stained with purple.

Cypripedium purpuratum, Lindl. in *Bot. Reg. XXIII.* t. 1991 (1837). Id. Gen. et Sp. Orch. p. 530 (1840). *Bot. Mag.* t. 4901. Van Houtte's *Fl. des Serres, XI.* (1856), t. 1158. Miq. Fl. ind. bat. III. p. 737. Benth. Fl. Hongkong, p. 364. C. sinicum, Hance Pl. nov. austro-chin, fasc. 2, p. 1.

First introduced about the year 1836 by Mr. Knight, our predecessor at the Royal Exotic Nursery, who left no record of its origin. The drawing in the *Botanical Register* was made from a plant that flowered in the autumn of that year in the nursery of Messrs. Loddiges, of Hackney, by whom it was communicated to Dr. Lindley with the erroneous information that it came from the Malayan Archipelago. Its only known habitat is in the island of

Hongkong, and on the mountains near the opposite Chinese coast, but where it is now become quite rare. As a species *Cypripedium purpuratum* is pretty and distinct, and interesting as being the third in chronological order of introduction of the coriaceous Cypripedes cultivated in European gardens.

C. Rothschildianum.

"Leaves more than 2 feet long and 2½—3 inches wide, green, glossy, strong. Peduncles reddish, with a few short hairs, three- (or more) flowered. Bract less than half the length of the glabrous ovary, oblong-ligulate, tridentate at the apex, pale yellowish green with blackish lines and a ciliate margin. Flowers equal in size to those of *Cypripedium præstans (glanduliferum)*; upper sepal cuneate-oblong, acute, yellowish with numerous longitudinal dark, almost blackish stripes, white at the borders; lower sepal nearly equal to the upper one, but shorter; petals linear, undulate at the base, yellowish green with dark longitudinal lines and dark blotches at the base; lip like that of *C. Stonei* and *C. præstans (glanduliferum)*, cinnamon-coloured with ochre border at the aperture. Staminode beak-like, broad at the base and narrowed at the apex where it is hairy."—H. G. Rchb. f. in Gard. Chron. III. s. 3 (1887), p. 457.

Cypripedium Rothschildianum, Rchb. in Gard. Chron. *loc. cit.* and p. 554. C. neo-guineense, Linden, *fide* L'Hort. internat. (Societé anonyme) in Gard. Chron. III. s. 3 (1888), p. 505 (Advt.).

Up to the time of going to press we have had no opportunity of seeing this remarkable species, only one plant, so far as we are aware, having flowered in England since its first introduction; the above description by Professor Reichenbach has therefore been copied from the *Gardeners' Chronicle* at the places quoted above, and where this Cypripede is said to be "one of the most astonishing introductions ever seen." The merit of introducing it is assigned, by the same authority, to Messrs. Sander and Co., of St. Albans, but disputed by the Director of L'Horticulture internationale (Societé anonyme), Parc Leopold, Brussels, who affirms that it was "Mr. J. Linden who introduced it first, from New Guinea, in May, 1887, and flowered it in January, 1888,"* when it received the name of *Cypripedium neo-guineense*, but which, not having been published at the time, must sink as a synonym of that under which it is described above. It is dedicated to Baron Ferdinand de Rothschild, M.P., of Waddesdon Manor, near Aylesbury, well known as one of the most munificent patrons of horticulture of our time.

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* *See* Gard. Chron. III. s. 3 (1888), p. 505 (Advt.).

C. Sanderianum.

Leaves broadly ligulate, obtuse, a foot or more long, equitant at base, with a sunk mid-nerve above, keeled beneath. Scapes longer than the leaves, deep purple, pubescent, 3—5 (or more) flowered. Bracts sub-triangular, acute, hairy, brown-purple, as long as or longer than the pale yellow, sub-triquetral ovary, which is also studded with purple hairs. Flowers 4 inches across from the apex of the upper sepal to the toe of the slipper; upper sepal broadly lanceolate, acute, concave, ciliolate, pale yellow-green with broad longitudinal brown stripes, hairy and keeled behind; lower sepal similar but somewhat smaller; petals narrow, ribbon-like, pendulous, 18—25 or more inches long, ciliate and broader at the base, pale yellow bordered with brown-purple to 2—3 inches of their length, then spotted with brown-purple to another 2—3 inches, the remainder dull purple with here and there a pale yellow bar or spot; lip calceiform, brownish purple above, pale yellow beneath, the infolded lobes narrow, pale buff-yellow. Staminode nearly oblong, pale yellow and purple, very hairy at the sides.

Cypripedium Sanderianum, Rchb. in Gard. Chron. XXV. (1886), p. 554. Sander's *Reichenbachia I.* t. 3.

A remarkable species of especial interest both to science and to horticulture; to the former because it brings the sub-section of the genus to which it belongs* morphologically nearer to the South American Selenipedia than any other Asiatic species known; to the latter on account of its being one of the handsomest of Cypripedes, and supplying the hybridist with a most distinct agency for the production of new and interesting forms. It was discovered by Förstermann in 1885 or 1886, while collecting orchids in the Malayan Archipelago for Messrs. Sander and Co. (the introducers, to whom only and its discoverer the precise habitat of the species is probably at present known).

C. Spicerianum.

Leaves linear-oblong, 6—9 or more inches long, more or less undulated at the margins, dark green above, spotted with purple on the under side towards the base. Scapes somewhat slender, erect, 9—12 inches high, one- (rarely two-) flowered. Bract linear-oblong, acute, whitish spotted with cinnamon-purple, sheathing the ovary to about half of its length. Flowers 3 inches across vertically; upper sepal broadly obcordate, folded at the middle, with the lateral margins much reflexed at the base, and

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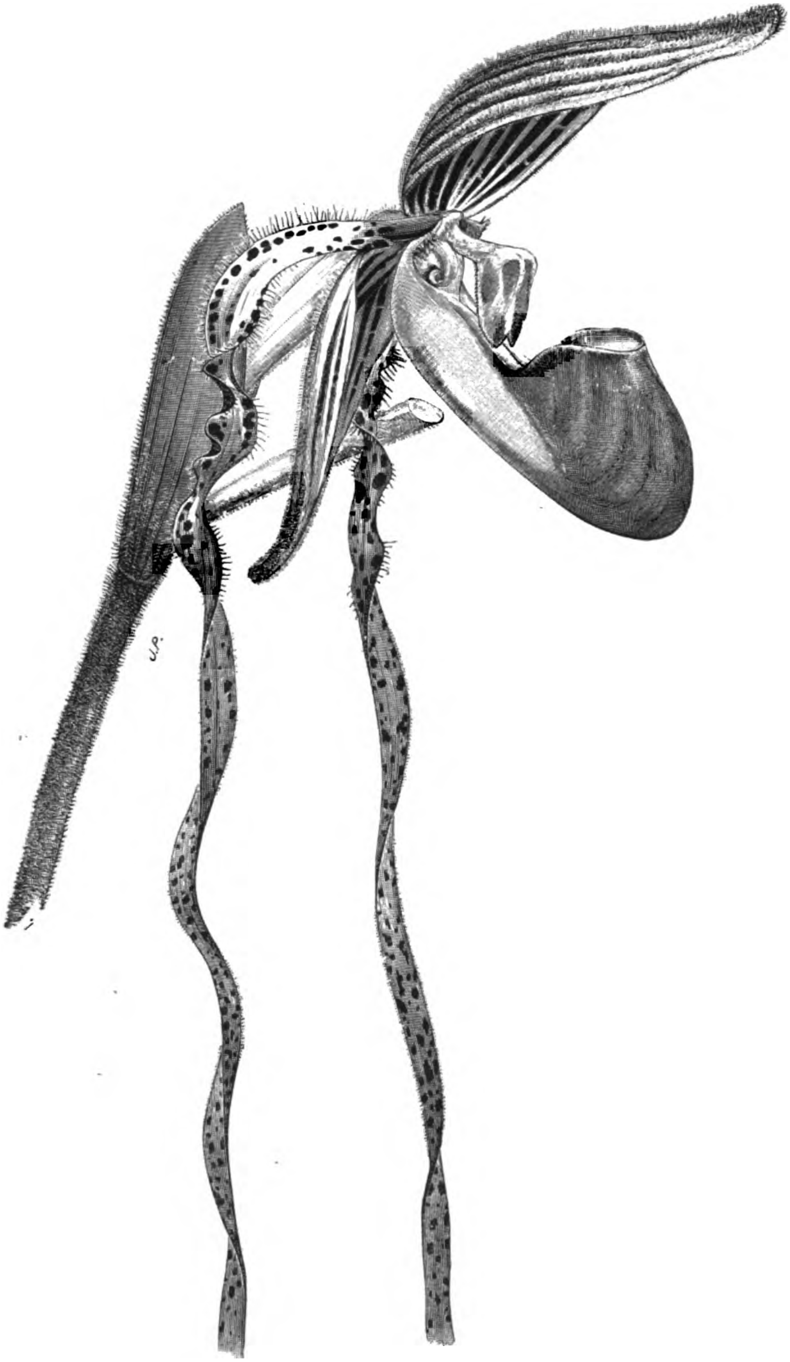
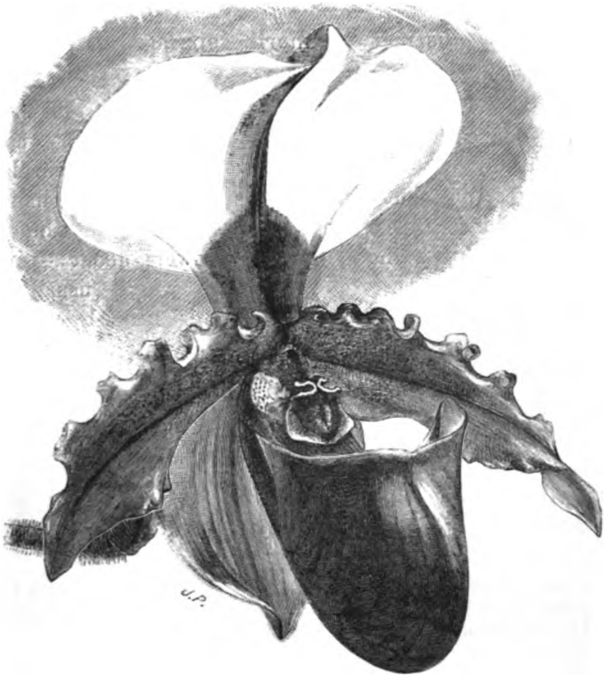
* See *Cypripedium Parishii, supra.*



Cypripedium Sanderianum.

the apical margin bent forwards, white except at the fold where there is a crimson-purple band, and at the base where there is a large green blotch speckled with dull red; lower sepal broadly ovate, acute, greenish white; petals ligulate, deflexed and curved forwards, undulate at the margins, yellowish green spotted with dull red and with a reddish crimson mid-line; lip somewhat bell-shaped, with rounded auricles, brown tinged with crimson. Staminode sub-orbicular, purplish-crimson margined with white.

Cypripedium Spicerianum. Rchb. in lit. ad. Veitch, 1879. Gard. Chron. XII. (1880), p. 40, icon. xyl. Id. Rchb. p. 363. *Bot. Mag.* t. 6490. *Illus. hort. XXX.* t. 473. *The Garden, XXIII.* (1883), t. 378. Williams' *Orch. Alb. III.* t. 119. *Belg. hort. XXXIII.* (1883), p. 289.



Cypripedium Spicerianum.

This beautiful species first became known to us in the autumn of 1878, when we received a flower from Mr. Herbert Spicer, of the Woodlands, near Godalming. The sender could give no information respecting the origin of the plant from which the flower had been gathered further than that he had received it and some others from India, amongst a mixed collection of orchids. Arrangements were made by which a portion of the Cypripedium plants passed into our hands for propagation, and subsequently we acquired the remainder; the species in the meantime had been named by Professor Reichenbach in compliment to the introducer. Not long afterwards its habitat was discovered in Assam it is said, by the collectors of Messrs. Low and Co. and of Messrs. Sander and Co., and a considerable number of plants was received by both firms from India; the habitat is thence known, but the precise locality has not yet been divulged.*

The flowering season of *Cypripedium Spicerianum* lasts from the beginning of November till Christmas. It is somewhat variable in colour, chiefly in the upper sepal, and several sub-varieties have been designated by name, but none such have yet come under our notice sufficiently distinct to merit separate description.

C. Stonei.

Leaves strap-shaped, 12—15 inches long, very leathery, almost fleshy, grass-green. Scapes 18—24 inches long, dull greenish purple, pubescent below the inflorescence, but with only a few scattered hairs along the 3—5 flowered rachis. Bracts lanceolate, acuminate, sheathing the almost glabrous ovaries to $\frac{1}{3}$—$\frac{1}{2}$ their length. Flowers about 4 inches across vertically; upper sepal cordate, acuminate, white, usually with 2—3 or more blackish crimson longitudinal streaks, keeled behind; lower sepal similar and nearly equal to it; petals linear, 5—6 inches long, pendent, twisted, with a few black ciliate hairs on each margin towards the base, pale tawny yellow to two-thirds of their length, spotted with brownish crimson, the apical third wholly brownish crimson; lip projecting, calceiform, dull rose colour, veined and reticulated with crimson, whitish beneath, the infolded lobes narrow, whitish. Staminode oval-oblong, yellowish white, fringed, except on the front side, with close-set bristly hairs.

Cypripedium Stonei, Hort. Low *fide* Hook. in *Bot. Mag.* t. 5349 (1862). *Illus. hort. X.* (1863), t. 355. Van Houtte's *Fl. des Serres, XVII.* t. 1792—93. Jennings' *Orch.* t. 12. Williams' *Orch. Alb. I.* t. 8.

var.—platytænium.

Flowers much larger in all their parts and more richly coloured; sepals broader, with broader streaks; petals nearly an inch broad at the widest, yellowish white at the base, densely spotted with reddish crimson from about an inch from the base, the spots becoming confluent towards and at the tips.

C. Stonei platytænium, Rchb. in Gard. Chron. 1867, p. 1118, icon. xyl. Id. *Xen. Orch. II.* p. 153, t. 161. Warner's *Sel. Orch. III.* t. 14. *Fl. Mag.* n. s. t. 414.

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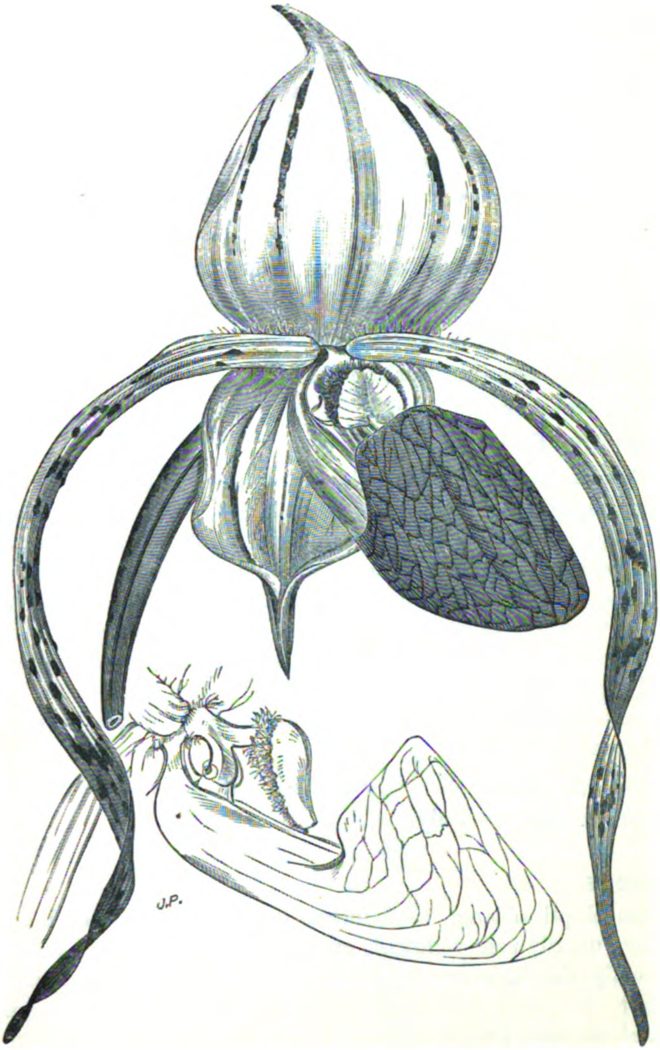
* "The interests of science are unfortunately sacrificed to the desire of the sole possessor of any useful information regarding the origin and native country (of a new orchid) that these should be withheld from the public."—*Botanical Magazine*, sub. t. 6037.

Native of Saràwak, in Borneo, where it occurs on limestone hills at 1,000—1,500 feet elevation, growing generally on rocks where there is but a slight accumulation of vegetable soil, and in the shade of the forest that covers the hills. It was first discovered by Sir Hugh Low, who sent plants to Messrs. Low and Co.'s Clapton Nursery in 1860. It flowered for the first time in this country in



Cypripedium Stonei.

the following year in the collection of the late Mr. John Day, at Tottenham, after whose then gardener, Stone, it is named.

The variety *platytænium* was imported along with a lot of *Cypripedium Stonei*, from Saráwak, in 1863, by Messrs. Low and Co. Some of the plants of this importation were acquired by Mr. Day, and amongst them, unknown to himself at the time, this superb variety, which for several years afterwards existed as a single specimen, the only one ever known to have been imported. It flowered for the first time in Mr. Day's collection in 1867, whence subsequently it became very sparingly distributed by division of the original plant. On the dispersion of Mr. Day's plants at Stevens' Rooms in the spring of 1880, the strongest pieces that had been retained by the owner were acquired by Sir Trevor Lawrence and Baron Schroeder; the last-named gentleman has since added others to his collection, so that by far the greater portion of the growths from the original plant of this remarkable orchid now forms part of the magnificent collection at The Dell.

No known orchid is more highly prized than *Cypripedium Stonei platytænium*, and no orchid has realised a higher price at a sale. From its first appearance it has been, and will probably long continue to be, the admiration of all orchid amateurs, and the envy of many who have not the satisfaction of seeing it in their own collections. And yet it is but a variation from the type in which the enlarged petals are the most striking characteristic; that it is no more than this was conclusively proved in the summer of 1887, when one of the petals of a flower produced by one of Baron Schroeder's plants reverted to the normal form.*

The flowering season of *Cypripedium Stonei* and its variety *platytænium* is from May to July.

C. superbiens.

Leaves elliptic-oblong, 5—7 inches long, 1½—2¼ inches broad, variable in colour, usually pale yellowish green tesselated with dull deep green, but occasionally the tints are bright and showy, as in *Cypripedium Lawrenceanum*.† Scapes 9—12 inches high, one-flowered. Bract short, scarcely one-third of the length of the ovary. Flowers with all the segments ciliolate, 4 inches across vertically; upper sepal broadly ovate, acute, white,

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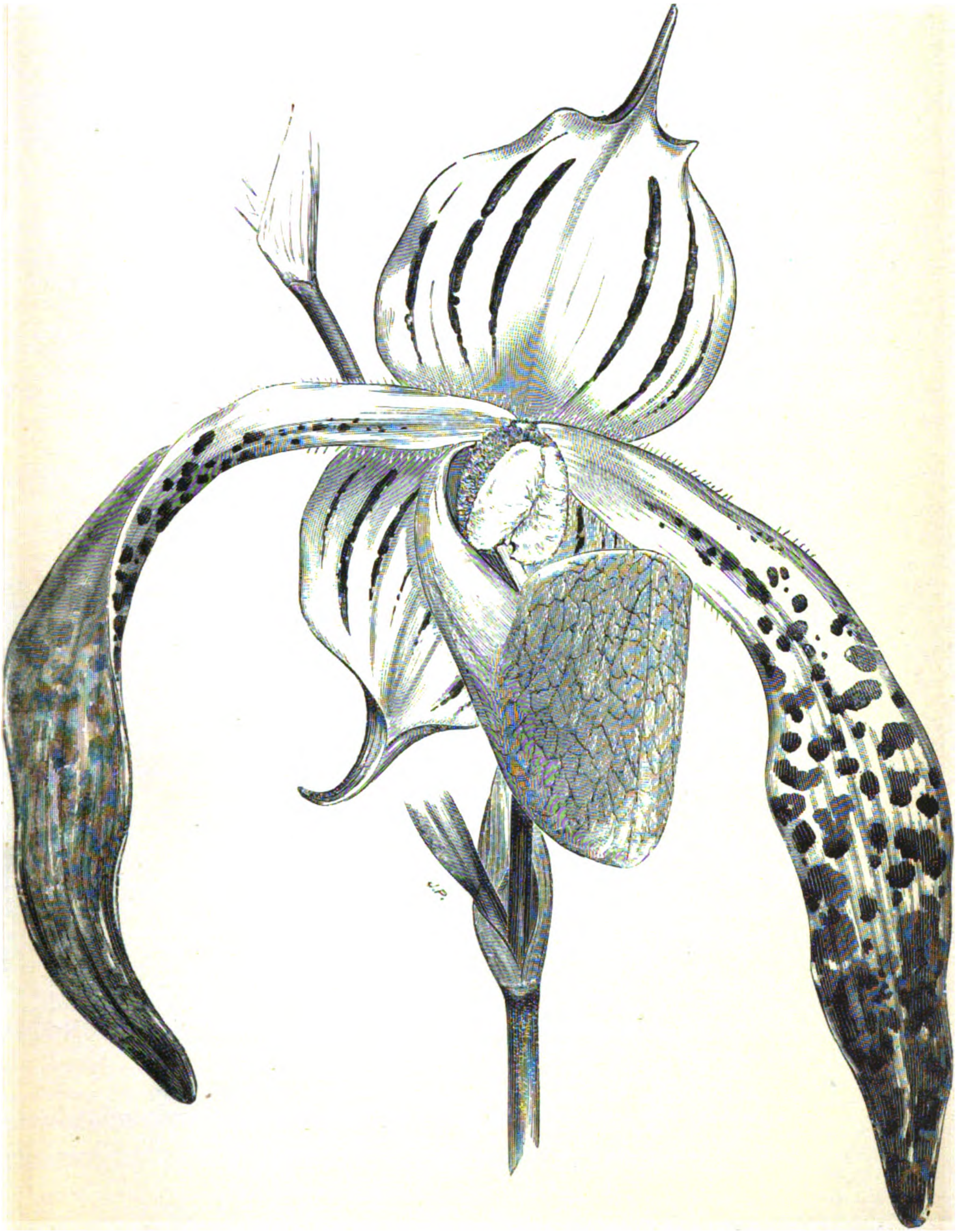
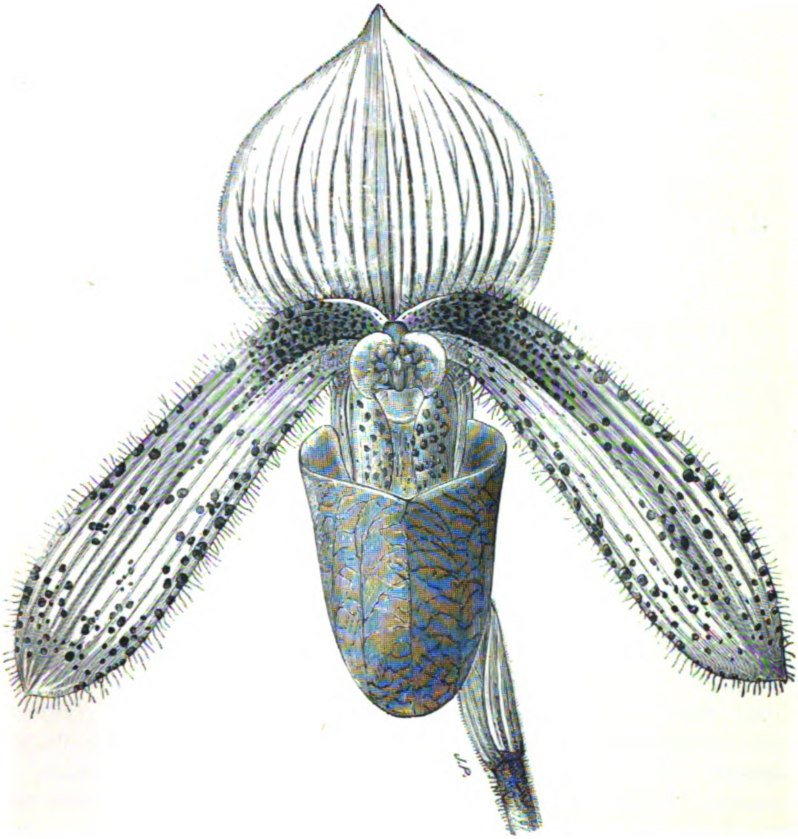
* See note in *Gardeners' Chronicle*, II. s. 3 (1887), p. 156, by Mr. N. E. Brown. As this is the only instance known of its having partially reverted to the original type, its constancy is virtually assured.

† This variability in the colour of the foliage is unquestionably due to cultural influence.



Cypripedium Stonei platytænium.

symmetrically striped with green; lower sepal ovate-lanceolate, much smaller; petals ligulate, deflexed, fringed at both margins with black hairs, white veined with green and much spotted with blackish warts, the spots at the margins being larger than the others; lip large, somewhat helmet-shaped, brownish purple in front, pale green beneath, the infolded lobes crimsonish and warty. Staminode sub-reniform, with a deep cleft on the basal side, and with two incurved cusps on the front-side, with a small tooth midway between them.



Cypripedium superbiens.

Cypripedium superbiens, Rchb. in Bonpl. 1855, p. 227. Id. in Allgem. Gartenzeit, 1856, p. 323. Id. *Xen. Orch. II.* p. 9, t. 103. Regel's Gartenfl. XII. (1863), p. 49. Warner's *Sel. Orch. II* t. 12. Van Houtte's *Fl. des Serres, XIX*. t. 1996. C. barbatum Veitchii, Van Houtte's *Fl. des Serres, XIV*. (1861), p. 161, t. 1453. C. Veitchianum, *Illus. hort. XII.* (1865), t. 429. De Puydt, *Les Orch.* frontisp. and p. 267. Rev. hort. 1870—71, p. 595, t. 78—79, icon. xyl. C. barbatum superbum, Belg. hort. 1883, p. 97.

A special interest is attached to this Cypripede from the fact that all the numerous specimens now growing in orchid collections have been derived from two plants; the botanical history of the species is, however, obscured by the uncertainty attending the origin of one of the two—the first introduced, which was received by Messrs. Rollisson, it is said, either from Java or from Assam; this plant was sold to Consul Schiller, of Hamburg, in 1855, whence it afterwards became distributed, by division, among European collections. The second plant appeared among an importation of *Cypripedium barbatum,* collected for us in 1857 by Thomas Lobb, on Mount Ophir, near the southern extremity of the Malay peninsula. The probability is very great that Messrs. Rollisson's plant did not come from either of the localities assigned to it, but from Mount Ophir, an hypothesis supported by the circumstance that no difference has been observed between the progenies derived from the two plants. Although originally found mixed with *C. barbatum,* its nearest affinities are *C. Curtisii* and *C. ciliolare.** The flowering season of *C. superbiens* is from May to July, and occasionally later.

C. tonsum.

Leaves oval-oblong, 5—7 inches long, tesselated with deep and pale green above, frequently spotted with purple towards the base beneath. Scapes erect, 12—15 inches high, dull greenish purple, one-flowered. Bract short and hairy, not more than one-third the length of the ovary. Flowers with a polished surface, about 4 inches across vertically; upper sepal broadly cordate, acute, folded at the mid-vein, minutely ciliolate at the margin, white symmetrically veined with green, the alternate shorter streaks sometimes purplish; lower sepal elliptic-oblong, acute, much smaller; petals spreading, sub-spathulate, broader than in most of the allied species, pale green with deeper green veins but sometimes stained with dull purple, with 3—5 blackish warts along the mid-vein, and a few smaller ones along the superior margin, which as well as the inferior one is destitute of cilia except near the apex, where there are sometimes a few black hairs; lip prominent, helmet-shaped, dull green tinged with brown and crimson, the infolded lobes broad and warty, almost meeting at their edges. Staminode pale green, reniform with a deep cleft in the basal edge, and with two incurved cusps on the front side, midway between which is a small rounded tooth.

Cypripedium tonsum, Rchb. in Gard. Chron. XX. (1883), p. 262.

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* See *supra,* pp. 16 and 20.

Discovered on the mountains of Sumatra, by Curtis, who collected it, unknown to himself at the time, mixed with *Cypripedium Curtisii;* botanically it is, however, nearer *C. javanicum* than the species with which it is locally associated. The specific name *tonsum,* "shorn," refers to the absence of the black marginal hairs that fringe the petals of the species included in the subsection of the genus (*C. venustum,* etc.) to which this belongs.

C. venustum.

Leaves elliptic-oblong, 4—6 inches long, deep green, marbled and blotched with pale greyish green above, heavily mottled with dull purple beneath. Scapes erect, 6—9 inches high, one- (rarely two-) flowered. Bract about one-half the length of the ovary. Flowers 2½ inches across vertically; upper sepal broadly cordate, acute, white with dark green veins; lower sepal ovate-lanceolate, acute, much smaller, pale green with dark green veins; petals spreading, sub-spathulate, margins ciliate, basal portion green with some blackish warts that are seated chiefly near the margins and on the mid-vein, apical portion dull purple toned with brown; lip sub-cylindric, pale yellow-green tinged with rose-colour and veined and reticulated with green, the infolded lobes tawny yellow, almost meeting at their edges. Staminode semi-lunate, with a narrow notch on the basal side, and a small tooth in front.

Cypripedium venustum, Wallich *fide* Sims in *Bot. Mag.* t. 2129 (1820). Loddiges' *Bot. Cab. VI.* t. 583 (1821). *Bot. Reg.* t. 788 (1824). Lindl. Gen. et Sp. Orch. p. 530. Warner's *Sel. Orch. II.* t. 24 (spectabile).

var.—pardinum.

Flowers larger; the sepals of a purer white, with the veins broader and of a deeper green; the warts on the petals larger and more scattered; the lip of a brighter colour, with the reticulations more prominent.

C. venustum pardinum, Gard. Chron. I. s. 3 (1887), p. 382, icon. xyl. C. pardinum, Rchb. in Gard. Chron. 1869, p. 554. *Fl. Mag.* n. s. t. 51.

Discovered by Dr. Wallich in Sylhet, in north-east India, early in the present century, and introduced, according to Dr. Sims (*Botanical Magazine, loc. cit.*), from the Botanic Garden at Calcutta by Messrs. Whitley, Brames and Milne, with whom it flowered in the November preceding the publication of Sims' description and plate; its actual date of introduction must therefore have been in the year 1819, and it was thence the first of the coriaceous species that became known to science, and the first that was brought under cultivation. It is the typical species of a sub-section of the genus, now a rather extensive group, of which the most obvious characteristics are the tesselated foliage, the homely colours of the flowers, the broad white upper sepal symmetrically striped with green (and sometimes deep purple), the warty petals fringed with black hairs, and the semi-lunate, almost horseshoe-shaped staminode. The variety *pardinum*, which is, in a horticultural sense, an improvement on the type, was introduced to the Royal Gardens at Kew. The flowering season of *Cypripedium venustum* is usually from January to March.

C. villosum.

Leaves linear-ligulate, 10—18 inches long, equitant at base, acute or obscurely two-lobed at the apex, of a uniform grass-green above, paler beneath and spotted with purple towards the base. Bract nearly as long as the ovary. Scapes very hairy, nearly as long as the leaves, one-flowered. Flowers among the largest in the genus, 5—6 inches across vertically, with a glossy varnished surface; upper sepal ciliolate, broadly oval, slightly hooded at the apex, the margins revolute towards the base, and with a hirsute keel at the back, brown-purple at the base and centre, the remaining area green with a narrow white marginal band; lower sepal similar but smaller, pale yellow green; petals ciliolate, spathulate, with some purple hairs at the base, undulate, bent forward, with a broad brown-purple mid-vein, the superior half yellow-brown, the inferior half paler; lip prominent, calceiform, brownish yellow with a tawny yellow margin at the aperture, infolded lobes broad, tawny yellow. Staminode oblong-cordiform, mucronate, with a small glandular boss in the centre, tawny yellow.

Cypripedium villosum, Lindl. in Gard. Chron. 1854, p. 125. *Illus. hort. IV.* t. 126 (1857). Linden's *Pesc.* t. 48. Van Houtte's *Fl. des Serres, XIV.* t. 1475.

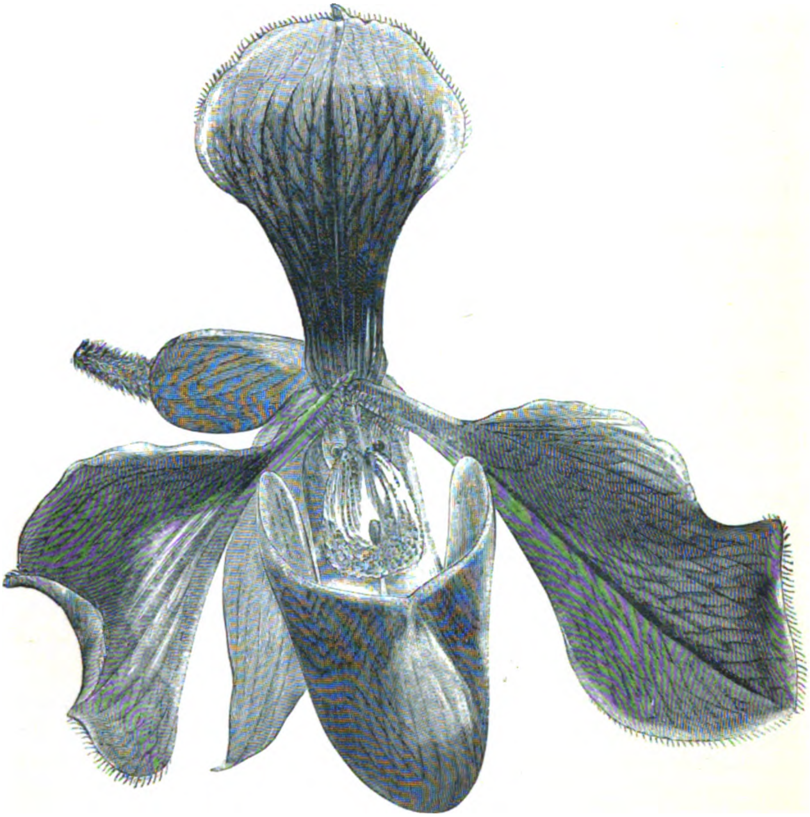
var.—Boxalli.

As distinguished from the species—the upper sepal is somewhat narrower at the base and the margins more reflexed, the central area is covered with numerous blackish spots that are more or less confluent in the middle and towards the base, and the white marginal band broader and purer; the lower sepal is more acuminate and usually bidentate at the apex; the petals are slightly narrower at the base, and their colouring has a more tesselated appearance.

C. villosum Boxalli, supra. C. Boxalli, Rchb. in. Gard. Chron. VII (1877), p. 367. Id. VIII, p. 776. *Illus. hort. XXVI.* p. 74, t. 345.

sub-vars. (of *villosum*).—*aureum* (Gard. Chron. XIX. (1883), p. 374), upper sepal bright yellow-green margined with white, the basal and central area shaded with brown, the petals and lip tinted with bright golden yellow; (of *villosum Boxalli*) *atratum* (Gard. Chron. I. s. 3 (1887), p. 210, with icon. xyl.), the blackish spots on the upper sepal enlarged and more confluent, the petals and lip deeper in colour; *pallidum*, the blackish spots on the upper sepal much reduced, the petals and lip paler.

First discovered by Thomas Lobb, on the mountains near Moulmein, at 4,000—5,000 feet elevation, and introduced by us in 1853; and subsequently, in the same region, by the Rev. C. Parish, who informs us that, as far as his experience goes, it is never found below 4,000 feet elevation; it occurs but sparingly on the Moulmein Mountains, but farther north, near Tongu, it is more abundant, growing in large masses in moss and decaying vegetable matter high up on the branches of trees. The variety *Boxalli* was introduced by Messrs. Low and Co., in 1877, through the collector whose name it bears, probably from the Tongu district. Although constant as regards the narrower bases of its floral segments and the more



Cypripedium villosum.

reflexed margins of the upper sepal, it is very variable in colour, some of the forms approaching in this respect so near the species as to be distinguishable from it only by the characters we have mentioned.

Cypripedium villosum has proved to be one of the most potent of hybridising agents, and is one parent of many of the finest forms yet raised. Its specific name *villosum*, "shaggy," refers to the very hairy peduncle, ovary, and bract; its flowering season, usually a prolonged one, lasts from December to March.

SELENIPEDIA.

The chief character that distinguishes the South American from the Asiatic Cypripedes, that is to say, the three-celled ovary with axile placentation, has been already pointed out. Besides this, there are some minor differences observable in the vegetative organs, in the inflorescence, and in the form of certain parts of the flower. The most obvious of these may be thus summarised:—

> The *rhizome* is sometimes creeping (*Cypripedium caricinum*, *C. Klotzschianum*). The *leaves* are of a uniform bright green, narrowly ligulate, linear, sedge-like in the two species named, and much longer than in EUCYPRIPEDIUM; they are complicate at the base, more or less acute at the apex, have a sunk mid-line above and a prominent keel beneath.
>
> The *scapes* are also usually much longer than in EUCYPRIPEDIUM; they are jointed below, few- or many-flowered above; the spathaceous bracts, both cauline and floral, are large and conspicuous, and are of lanceolate acuminate form.
>
> The *flowers* expand successively along the rachis and are rarely all open at one time. The upper sepal is much longer than broad; the connate lower sepals are together larger than the upper one; the petals are bearded at the base, frequently pendulous and excessively elongated. The staminode is fringed along the back edge with blackish purple hairs.*

About ten species are known to be genuine, of which six inhabit the Cordilleras of western South America, from Bolivia to Chiriqui in Central America, at elevations of 3,000—5,000 feet; three occur on the mountains of British Guiana and one on the Organ Mountains, near Rio de Janeiro. The localities indicated on the accompanying

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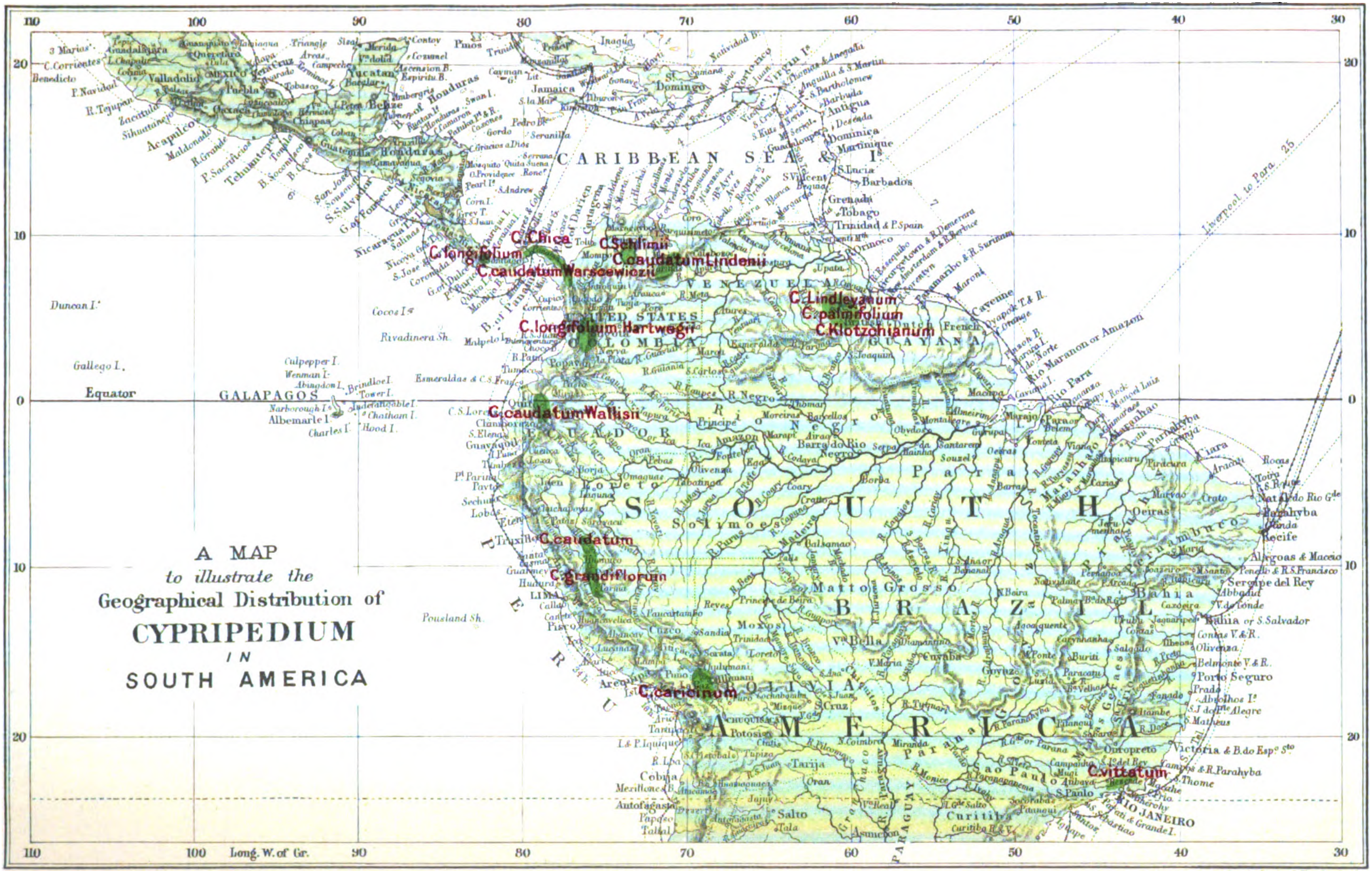
* *Cypripedium Chica* and *C. palmifolium* do not conform to all the above characters, and constitute the sub-section *Foliosæ* of Bentham and Hooker.



A MAP
to illustrate the
Geographical Distribution of
CYPRIPEDIUM
IN
SOUTH AMERICA

Stanford's Geog^l. Estab^t. London

map must, in several cases, be accepted only as approximately true; the names given by plant collectors are often not to be found on any map within reach and are, moreover, frequently misleading.

Cultural Note.—The cultural treatment of all the members of this section, both species and hybrids, is the same as that of the East Indian Cypripedes, with the exception of the temperature, which, on account of the altitude at which the species occur in a wild state, should be 3°—5° C. (5°—9° F.) lower. All the species in cultivation, with the exception of *Cypripedium Schlimii* and, perhaps, *C. Klotzschianum*, whose scapes are few-flowered, continue in flower for several months; for this reason the flowering season of each is not given in the following pages.

Cypripedium Boissierianum.

Leaves linear-ligulate, 20—25 or more inches long. Scapes stoutish, erect, as long as the leaves; bracts, both cauline and floral, lanceolate, acuminate, 3—4 inches long, somewhat inflated. Flowers 6 inches across vertically, pale yellow-green, veined and reticulated with dark green, the sepals and petals margined with white; upper sepal lanceolate, acuminate, crisped at the margin; lower sepal oval-oblong, concave, as broad again as the upper sepal and less conspicuously crisped at the margin; petals linear-ligulate, broader at the base, gradually attenuated towards the tip, 4—5 inches long, spreading horizontally, twisted, with crisped margins: lip prominent, the sac sub-cylindric, brownish in front, the infolded lobes broad, much spotted with greenish brown, the sinus between the sac and the infolded lobes with a triangular process. Staminode sub-rhomboidal with a notch in the back margin.

Cypripedium Boissierianum, Rchb. in lit, Xen. Orch. I. p. 3 (1854). Gard. Chron. l. s. 3 (1887), p. 143, icon. xyl. C. reticulatum, Rchb. in Gard. Chron. XVIII. (1882), p. 520. Selenipedium Boissierianum, Rchb. Xen. Orch. I. p. 3. *Id.* p. 176, t. 62. S. reticulatum, Rchb. Xen. Orch. II. p. 223.*

The early botanical history of this species is closely connected with that next described (*Cypripedium caudatum*). That they were both discovered by the Spanish botanists, Ruiz and Pavon, during their exploration of Peru and Chili (1778—89), is proved by the existence of herbarium specimens gathered by them, the genuineness of which has never been called into question, and which were doubtless from the Huanuco district which they explored soon after their arrival in Peru, and to which they again subsequently returned (*Floræ Peruvianæ et Chilensis Prodromus Præf*, p. xi.) Nothing more was known of either species till William Lobb's mission to the Andean region for us, which extended over the five years 1842—47. Lobb, who mentions Ruiz and Pavon in his letters, and of whose labours he evidently possessed some knowledge, travelled over pretty much the same ground in the Huanuco district as they did, first in 1842—43, and again in 1847, when he brought home *C. caudatum*. In the meantime Dr. Lindley had partially described *C. caudatum* in his *Genera and Species of Orchidaceous Plants* (p. 531) from an imperfect specimen obtained from an herbarium of Ruiz and Pavon preserved at Lima, and sent by Matthews to Sir W. J. Hooker at Kew, adding the following remarkable passage: "There is also in Sir W. Hooker's herbarium a second species taken by Matthews out of the same collection but it is too imperfect to be introduced here."

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* *Selenipedium Czerwiakowianum* mentioned here is unknown to us.

We now come to Reichenbach's description of *Selenipedium Boissierianum* in the *Xenia Orchidacea*, in which he says:—

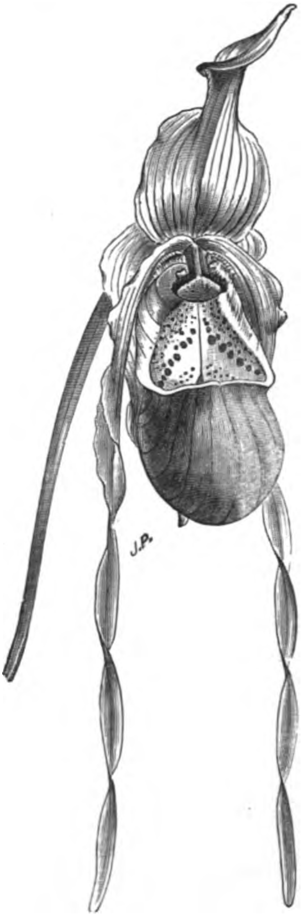
> "Wir kennen ein einziges Exemplar Pavon's mit der Etikette '*Cypripedinm grandiflorum*, Pillao 1787.' Der Name '*grandiflorum*' ist nicht eben passend, nachdem wir andere Selenipedia mit grösserer oder gleich grosser Blüthe haben. Wir glaubten demnach den Manuscriptnamen ohnedies (weil die Pflanze kein ächtes Cypripedium) nicht beibehalten werden konnte, ganz fallen lassen zu müssen und es gewährte uns grosse Freude die herrliche Pflanze, vielleicht ein *Unicum* in Europas Sammlungen, ihrem Besitzer Herrn Edmond Boissier zu widmen."

The only authentic Ruiz and Pavon specimens in England known to us, besides those examined by Dr. Lindley, are two in excellent condition preserved in the Natural History Museum at South Kensington; these specimens, one of flower the other of foliage, are labelled *Cypripedium grandiflorum*, but they are unmistakeably *C. caudatum* (Lindl.), and therefore in disagreement with Boissier's specimen. Under these circumstances we think the best course is to pass over the herbarium name *grandiflorum* and to adopt Reichenbach's *Boissierianum* for the species described above.

This first became known in British gardens through our collector, Walter Davis, who found it, unknown to himself at the time, with *Cypripedium caudatum*, near Muña in the Huanuco district of Peru in 1875—76, in the same locality in which the latter had been collected by William Lobb in 1847, and presumably both species by Ruiz and Pavon 60 years previously. A single plant only survived the voyage, and from this, so far as we know, originated all the plants now in cultivation.*

C. caricinum.

Leaves in tufts of 4—6, from a creeping rhizome, linear, acute, sedge-like, deep green, 12—18 inches long. Scapes as long as the leaves, erect, purplish green, 3—6 flowered. Flowers medium-sized; upper sepal lanceolate, acute, undulate, 1½ inches long, greenish white with



Cypripedium caricinum.

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*Reichenbach in the *Gardeners' Chronicle XVIII.* (1882), p. 520, states that this species, which he there describes under the name of *Cypripedium reticulatum*, for we are persuaded they are one and the same, was found by Gustav Wallis while travelling for M. Linden, and afterwards by Smith, one of Messrs. Low's collectors, before it was sent to us by Davis, but he gives no locality.

pale yellow-green veins; lower sepal ovate-oblong, acute, whitish; petals linear, 3—5 inches long, pendulous, twisted, white tinted with rose towards the tips, veins light green; lip calceiform, light yellow-green with deeper green venation, the infolded lobes ivory-white spotted with green and purple along the edge. Staminode oval-oblong, green with a purple fringe on the basal side.

Cypripedium caricinum, Lindl. in. Paxt. Fl. Gard. I. sub. t. 9 (1850). *Bot. Mag.* t. 5466. Selenipedium caricinum, Rchb. in Xen. Orch. I. p. 3 (1854) (name only). S. Pearcei, Van Houtte's *Fl. des Serres, XVI.* t. 1648. Cypripedium Pearcei, Hort.

Originally discovered by Bridges in Bolivia,* from whose herbarium specimen it was named and described by Dr. Lindley. It was introduced by us in 1863 through Pearce, and flowered for the first time in this country, at our Chelsea Nursery, in May of the following year. The specific name, from *carex*, "a sedge," refers to the sedge-like leaves.

C. caudatum.

Leaves ligulate, acute, 10—15 inches long. Scapes robust, pubescent, pale green, 15—20 inches long, 1—4 but usually 3 flowered; pedicels with ovary 6 inches long, with a compressed sheathing pale green bract at the base of each. Flowers the largest in the section; upper sepal 6—7 inches long, lanceolate, acuminate, pubescent on the back, pale yellow or whitish with longitudinal yellow-green veins in front; lower sepal similar but broader, and concave at the base; petals linear, ribbon-like, pendulous, 18—25 or more inches long,† dull brownish crimson, except at the base where they are yellowish; lip calceiform, prominent, 2—2½ inches long, brownish green passing into bronzy green around the aperture, the veins and reticulations dark green, pale yellow-green beneath, the infolded lobes meeting at their edges, ivory-white, spotted with purple inside the yellow-brown border around the aperture. Staminode triangulate, auriculate, yellowish, the auricles fringed with brown-purple hairs.

Cypripedium caudatum, Lindl. Gen. et Sp. Orch. p. 531 (1840). Id. in *Paxt. Fl. Gard. I.* p. 37, t, 9 (1850—51). Van Houtte's *Fl. des Serres, VI.* t. 566 (copied from Paxt. Fl. Gard.). Regel's *Gartenfl.* 1870, p. 257, t. 661. De Puydt, *Les Orch.* p. 259, t. 10. Warner's *Sel. Orch. II.* t. 1. Selenipedium caudatum, Rchb. in Bonpl. 1854, p. 116. Id. Xen. Orch. I. p. 3 (name only). Linden's *Pesc.* t. 24.

var.—Lindenii.

Lip not saccate but ribbon-like and pendulous like the petals, to which it conforms, except in being broader and concave at the base.

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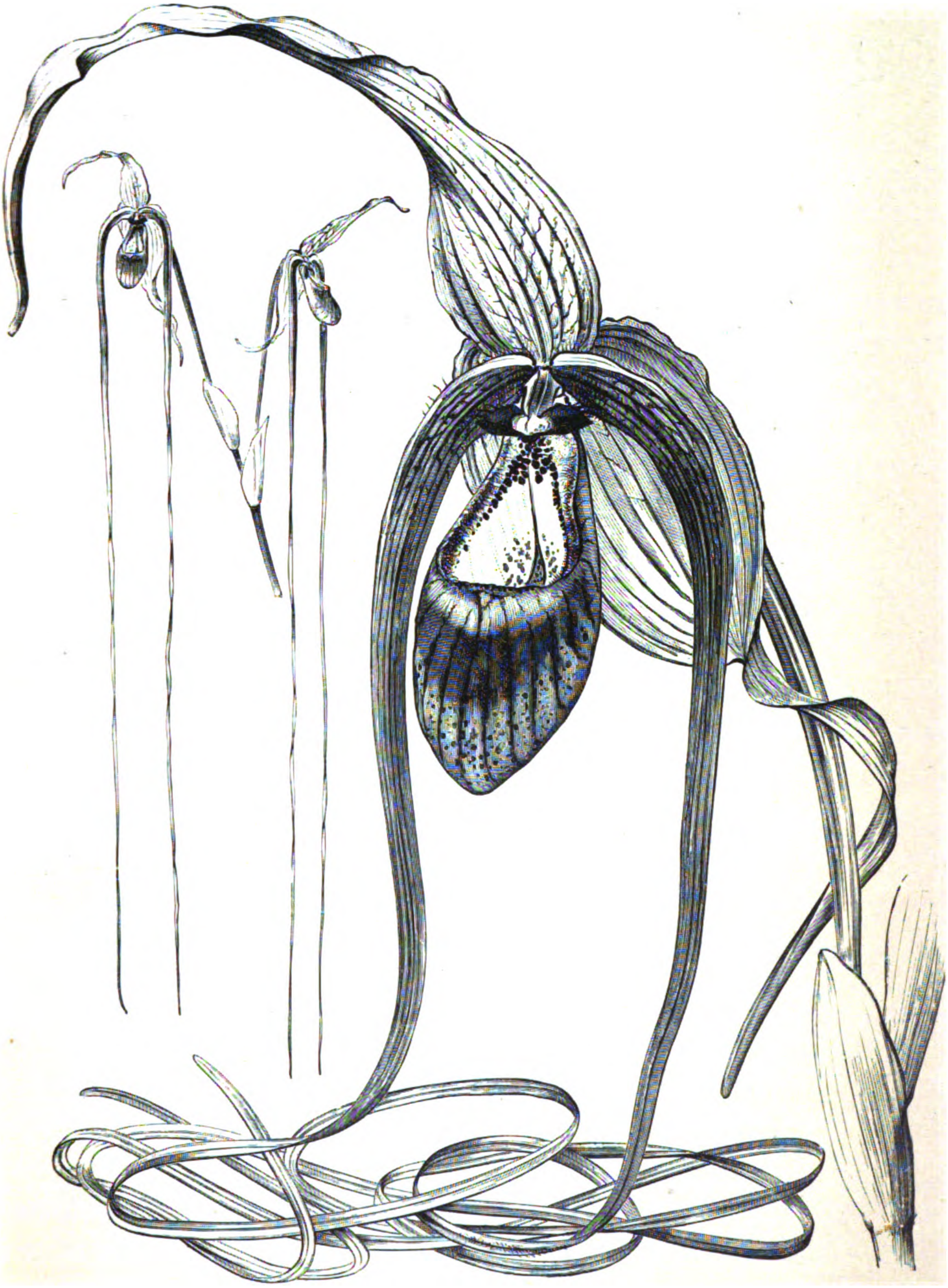
[*] At a place called Tampoto, a name we do not find on any map to which we have access. Pearce gave no locality.

[†] When the flower first expands, the petals are 3—4 inches long; they continue growing for about ten days, in which time they usually attain their full length. From the second to the seventh day they have been observed to increase in length as much as 2 inches each day. nstances have been noticed in which the total length of the petals exceeded 30 inches.



Cypripedium caudatum.

There is also a third fertile stamen developed from the column below the stigmatic plate and at its base.

C. caudatum Lindenii, supra. Cypripedium Lindenii, Van Houtte's Fl. des Serres, XVIII. (1870), p. 155. Selenipedium caudatum Lindenii, Benth. in Jour. Linn. Soc. XVIII. (1881), p. 360. Uropedium Lindenii, Lindl. in Orch. Lind. p. 28, No. 143 (1846). Id. in Bot. Reg. 1846, sub. t. 58. Brongn. in Ann. Sc. Nat. ser. 3, XIII. p. 113. Rchb. *Xen. Orch. I.* p. 32, t. 15. *Belg. hort.* 1854, p. 193. Regel's Gartenfl. X. (1861), t. 315, icon. xyl. Linden's *Pesc.* t. 2.

var.—Wallisii.

Flowers somewhat smaller than the type, also paler and more delicate in colour; sepals ivory-white with yellow-green veins; toe of slipper mottled with pale rose which passes into yellow-green at the margin of the aperture; infolded lobes pure white with some red-purple spots at the outer edge. Staminode pale yellow in the centre, brownish purple at the angles.

C. caudatum Wallisii, supra. Selenipedium Wallisii, Rchb. *Xen. Orch. II.* p. 189, t. 191. Cypripedium Wallisii, Hort.

var.—Warscewiczii.

Leaves broader, shorter, and of a deeper green; sepals with a more decided tinge of yellow, and with pale orange-yellow veins; petals dull rose-purple, except at the base, where the colour is normal; lip deep yellow-brown in front, yellow-green beneath.

C. caudatum Warscewiczii, Godefroy's *Orchidophile*, 1887, p. 337. C. Warscewiczianum, Rchb. in Bot. Zeit, 1852, p. 692. C. caudatum roseum, Rev. hort. 1867, p. 133. Selenipedium Warscewiczianum, Rchb. in Bonpl. 1854, p. 116. Xen. Orch. I. p. 3 (name only). S. caudatum roseum, *Illus. hort. XXXIII.* (1886), t. 596.

As already stated under *Cypripedium Boissierianum*, the botanical history of that species is identical with *C. caudatum* up to the date of publication of the latter by Dr. Lindley in his *Genera and Species of Orchidaceous Plants* in 1840. Two years afterwards *C. caudatum* was found by Hartweg "in wet marshy places near the hamlet of Nanegal, in the province of Quito, but he did not send it home."* The plant remained unknown to horticulture till its introduction from the Huanuco district of Peru by William Lobb in 1847, and where, thirty years afterwards, it was collected by Davis. In the meantime, in 1862, it had been discovered in the Caupolica district, probably in or near the locality in which it had been found by Hartweg, on the Andes of Ecuador, at 5,000—6,000 feet elevation, by Pearce, who sent a few plants to our Chelsea Nursery, which he shipped at Guayaquil. In the Muña locality, *C. caudatum* grows chiefly on rocks in decayed vegetable matter, sometimes under brushwood, sometimes fully exposed. It flowered for the first time in this country in Mrs. Lawrence's collection at Ealing Park in the spring of 1849.

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* Lindl. and Paxt. Fl. Gard. I. p. 37.

The variety *Lindenii* is an anomalous form, now generally regarded by scientists either as a dimorphism, or an abnormal peloria state of *Cypripedium caudatum*, an hypothesis first broached by the distinguished French botanist, A. Brongniart.* It was constituted a new genus by Lindley, under the name of *Uropedium Lindenii*, in which he is followed by Reichenbach, who rejects the hypothesis of its being a dimorphism of *C. caudatum*, from the fact that the two have never been found growing together, and that the number of observed plants of the Uropedium is too great to admit of its being regarded as an accidental form.† This curious plant was discovered by Linden in 1843, at an altitude of 5,000 feet,‡ growing among the underwood composed chiefly of *Weinmannia* and *Eugenia* and the tall ferns scattered over the meadow-like savannahs lying between the Cordillera of Merida and Lake Maracaybo, where also ten years later it was gathered by Wagener.§ It was subsequently collected by Schlim, near Ocaña, at an altitude of 5,000—7,000 feet, growing on rocks and even on trees, from which locality it has been sent to Europe by other collectors. It flowered for the first time in Europe in the collection of M. Pescatore, at St. Cloud, near Paris, in 1850.

The variety *Wallisii* was discovered in Ecuador, by the collector whose name it bears, in 1872—3, and a little later (1876) by Davis, in the valley of Chinchao, in the Huanuco district of Peru. In this locality it occurs on the limestone rocks in full exposure to the sun's rays and where the range of temperature during the twenty-four hours of the day is very considerable.

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* Annales des Sciences naturelles, XIII. (1849), p. 113. This view is immensely strengthened by the recent appearance of a monstrous form of *Cypripedium caudatum*, which is figured and described in the *Gardeners' Chronicle*, XXVI. (1886), p. 268—69. This flower had three separate sepals, two long petals, and a lip about half-way between the ordinary saccate form and the long-tailed petals ; the column bore three perfect stamens. Bentham and Hooker refer the Uropedium of Lindley to Selenipedium, with the remark that "*S. caudato* in omnibus conformis, nisi labello non calceolato, sed petalis conforme vel basi paullo latiore concavoque," but no mention is made of the third fertile stamen.

† Nie haben wir erfahren dass *Selenipedium caudatum* und *Uropedium Lindenii* untereinander wachsen, und die Masse der von letzter Art beobachteten Individuen ist ohnedies zu gross um an eine zufällige Forme zu denken dürfen.—*Xen. Orch. I.* p. 36.

‡ Pescatorea, sub. t. 2.

§ According to the late M. Roezl, *Cypripedium caudatum Lindenii (Uropedium Lindenii)* is found in various parts of New Granada, at altitudes of 4,000—6,000 feet, growing indifferently upon trees, upon the trunks of dead trees, on rocks, or by the road side, but never in great abundance.—Godefroy's *Orchidophile*, 1883, p. 570.

The variety *Warscewiczii* was first detected by the excellent Polish botanical explorer Von Warscewicz on the mountains of Chiriqui in Central America, where, according to R. Pfau, it grows "exclusively on the tops of the highest trees, at 60—100 feet and more above the ground."* It differs from the typical *Cypripedium caudatum* chiefly in the deeper and brighter colour of its flowers, especially of the petals and labellum. This form is best known in British gardens under the name of *C. caudatum roseum.*

Another form is known as the Luxembourg variety from its having been first detected in the Luxembourg garden at Paris. It is easily recognised by its narrower leaves that are very stiff, leathery and sub-erect, giving the plant the aspect of a Vanda, especially of *V. cœrulescens* in a young state. The flowers of this variety have not yet been seen by us.

The specific name *caudatum,* literally "tailed," or "furnished with tails," refers to the greatly elongated petals.

C. Klotzschianum.

"Pedunculo subtereti, basi nunc unifoliato, puberulo, squamato, squamis supremis oblongis, obtusis, apice 2–3 floro; bracteis ovatis, acutis, cucullatis; perigonio phyllis supremo lanceolato, acutiusculo, extus pubescente, lateralibus extremis coalitis latioribus, cæterum æqualibus; perigonii phyllis lateralibus internis lanceolatis, apice valde attenuatis, margine undulatis; externis tertia parte longioribus; labello ovato contracto, ore subovali; stamine sterili trilobo, lobo medio acuto, lateralibus transversis, rhombeis, puberulis."

"Blätter lederartig, lineallanzettlich, fein zweispitzig, über fusslang. Bluthenstiel bis 15″ hoch. Blüthen so gross wie bei *Cypripedium Lindleyanum.*"† H. G. Reichenbach fil. in Linnæa XXII. (1849), p. 811.

Leaves from a creeping rhizome, 6—8 to each shoot, distinctly distichous, linear, sedge-like, 12—15 or more inches long, imbricate at base, acute with a sunk mid-line, keeled beneath, deep green. (As seen in the plants in cultivation under the name of *Cypripedium Schomburgkianum*).

Scape upwards of 2 feet long, pubescent, the cauline bracts narrowly lanceolate, the floral bracts broader. Flowers about 2 inches across vertically; upper sepal lanceolate, acute, symmetrically veined; lower sepal broader, ovate, acute; petals linear, acuminate, 3 inches long, pendulous or sub-pendulous; lip cylindric; the infolded lobes nearly meeting at their edges. (From dried specimen gathered by Mr. Im Thurm, and preserved in the Kew Herbarium).

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* Gard. Chron. XX. (1883), p. 722.

† In all the dried specimens we have examined, the flowers are *smaller* than in *Cypripedium Lindleyanum.*

Cypripedium Klotzschianum, Rchb. in Linnæa loc. cit. supra. Id. Walp. Ann. III. p. 602 (1852—53). C. Schomburgkianum, Klotzsch, *fide* Schomb. Bot. Rem. in Brit. Guiana, p. 59 (1876). Selenipedium Klotzschianum, Rchb. Xen. Orch. I. p. 3 (name only).

Discovered by Schomburgk during his exploration of British Guiana, 1840—44, growing in the crevices of the granite rocks at the Ruéimeru Waterfall, and on the banks of the River Rué. It was gathered by Mr. Everard Im Thurm, in 1885, on the Roraima Mountain, whence it was imported by Messrs. Sander and Co. in the following year. The species is named in compliment to Dr. Klotzsch, an eminent German botanist, and for some time Director of the Botanic Garden at Berlin.

As we have seen no plant in flower up to the date of going to press, the above description is all that we are at present able to give; the sepals and petals are said to be brown, and the lip greenish brown with a reddish tint superadded. Although the plant when not in flower is scarcely distinguishable from *Cypripedium caricinum*, the nearest affinity of the species is unquestionably *C. Lindleyanum.*

C. Lindleyanum.

Leaves strap-shaped, 20—25 inches long, and 2—2½ inches broad, bright grass-green, pale yellow at the margin. Scapes 30—40 inches long, pubescent, green from the base upwards, reddish along the rachis. Flowers 2—2½ inches across vertically; upper sepal oblong, acute, pubescent, undulate at the margin; light green with alternately longer and shorter longitudinal red-brown veins; lower sepal broader, elliptic, concave, bidentate at the apex, pale green with red-brown veins; petals deflexed, linear-oblong, with undulate and ciliate margins, pale green with red-brown veins; lip helmet-shaped, green with red-brown veins and reticulations, the inflexed lobes broad and densely spotted with red-brown. Staminode sub-quadrate, pubescent, yellow-green.

Cypripedium Lindleyanum, Schomb. Vers. einer Flora von Brit. Guiana III. p. 1069 (1848). Rchb. in Gard. Chron. XXV. (1886), p. 680. Selenipedium Lindleyanum, Rchb. Xen. Orch. I. p. 3 (1854) (name only). S. Kaieteurum, N. E. Brown in Gard. Chron. XXIV. (1885), p. 262.

This also was first discovered by Schomburgk, during his exploration of British Guiana, on the southern slopes of the Roraima Mountain at 6,000 feet elevation, in grassy swamps, along with Heliamphora, Utricularia, etc., flowering in November. It was rediscovered in the same locality, in 1881, by our collector David Burke, who brought plants to our Chelsea Nursery in the autumn of that year, but none of which flowered till January, 1886. In the meantime it had been found by Mr. Jenman, Superintendent of the Botanic Garden at Georgetown, Demerara, growing on the rocks under the Kaieteura Fall, on the Potaro River, and communicated by him to the Royal Gardens at Kew, where it flowered in the autumn of 1885. The species is named in compliment to Dr. Lindley, who "unwillingly consented at the particular instance of Dr. Schomburgk to allow this plant to bear his name, he having no title to the compliment."*

C. longifolium.

Leaves narrowly ligulate, tapering to an acute point, 18—24 inches long. Scapes stoutish, erect, as long as the leaves, deep purple, pubescent, 6—10 or more flowered. Flowers 3½—4 inches across from the tip of the upper sepal to toe of slipper; upper sepal ovate-lanceolate, undulate, pale green with rose-colour veins and whitish margin; lower sepal nearly as broad again as the upper one, ovate, acuminate, pale green with green veins; petals linear-lanceolate, spreading, slightly twisted, pale yellow-green with rose-colour margins except towards the base where the margins are whitish; lip calceolate, with an angular auricle between the sac and the inflexed side lobes, yellow-green tinged with brown in front, the infolded lobes yellow-green dotted with rose-purple. Staminode triangular-cordate, pale yellow-green with a blackish fringe on the back margin, and a blunt, deflexed tooth on the front one.

Cypripedium longifolium, Rchb. et Warsc. in Bot. Zeit. 1852, p. 690. *Bot. Mag.* t. 5970 (1869). *Belg. hort.* 1873, p. 65. Selenipedium longifolium, Rchb. Xen. Orch. I. p. 3 (name only). Id. in Gard. Chron. 1869, p. 1206. S. dariense, Rchb. S. Reichenbachii, Endres *fide* Rchb. Cypripedium Reichenbachii, Hort.

var.—gracile.

Leaves narrower, scapes more slender and paler in colour, and the bracts more compressed. Flowers somewhat smaller and coloured, as in the variety *Hartwegii.*†

C. longifolium gracile, supra. C. gracile, Hort.

var.—Hartwegii.

Plant more robust with longer and broader leaves; scapes taller, green (not purple as in the type). Flowers somewhat larger, the dorsal sepal usually with a pale rose-colour stain on the apical half, the petals bordered with rose-pink.

C. longifolium Hartwegii, supra. C. Hartwegii, Rchb. in Bot. Zeit. 1852, pp. 714, 765. Selenipedium Hartwegii, Rchb. in Bonpl. II. p. 116. Id. Xen. Orch. I. p. 3 (name only), and p. 70, t. 27. Id. Otia. Hamb. I. pp. 29, 30. Cypripedium Roezlii, Regel's *Gartenfl.* 1871, p. 164. *Id.* 1873, t. 754. Rev. hort. 1873, p. 416, icon. xyl. *Illus. hort.* 1873, t. 138. *Bot. Mag.* t. 6217. Selenipedium Roezlii, Rchb. in Regel's Gartenfl. 1871, p. 164. S. longifolium coloratum, Rchb. in Gard. Chron. 1873, p. 289.

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* Gen. et Sp. Orch. p. 531.

† As seen in the collection of Mr. R. I. Measures at Cambridge Lodge, Camberwell, a collection exceptionally rich in rare Cypripedes.

var.—Hincksianum.

Scapes shorter and bearing fewer flowers than those of the variety *Hartwegii*, but conforming in every other respect to it.

C. longifolium Hincksianum, supra. C. Hincksianum, Rchb. in Gard. Chron. IX. (1878), p. 202.

Cypripedium longifolium was first discovered by Warscewicz, in 1849, on the Cordillera of Chiriqui, at 5,000—7,000 feet elevation. It remained known to science only as an imperfect herbarium specimen till 1867, when it was re-discovered by Endres, by whom it was introduced into European gardens. In its native home it is a sub-terrestrial plant, growing among the moss beneath the trees of the forest, always in the shade and flowering all the year round.* Of the origin of the variety *gracile* we find no record. The variety *Hartwegii*, better known in gardens under the name of *Roezlii*, was first detected by Hartweg about the year 1842, on the eastern slopes of the Andes of Ecuador, near Quito, at 4,000 feet elevation,† while collecting plants in that region for the Horticultural Society of London. It was subsequently found by Dr. Seeman on the Isthmus of Darien, and still later by Roezl (1871) on the banks of the small river Dagua that flows down the western slopes of the central Cordillera of New Granada; by the last-named collector it was introduced to M. Linden's horticultural establishment at Ghent, whence it became generally distributed among British and continental gardens; it flowered for the first time in Europe in the St. Petersburg Botanic Garden in January, 1873, and in England in January of the following year at our Chelsea Nursery. The variety *Hincksianum* is a more recent importation that appeared for the first time in the collection of Captain Hincks, at Breckenbrough, Thirsk. The three varieties we have distinguished above are, in fact, nothing more than geographical forms differing from the original type and from each other more in their vegetative organs than in any other particular. The flowers of the varieties *Hartwegii*, *gracile*, and *Hincksianum* are more brightly coloured than those of *C. longifolium* proper, but are not distinguishable from each other in this respect.

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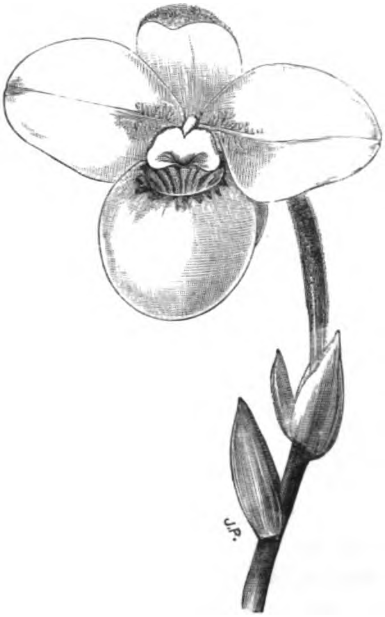
* R. Pfau in Gard. Chron. XX. (1883), p. 722.

† The presence of *Cypripedium longifolium* in this latitude seems to require confirmation. The plants now in cultivation under the names of *C. Hartwegii* and *C. Roezlii* show no tangible characters by which the one may be distinguished from the other All the *C. longifolium* forms in cultivation have been brought from the northern geographical limits of the Selenipedia, a circumstance that has occasioned some doubt as to the correctness of the locality assigned to Hartweg's discovery.

C. Schlimii.

Leaves ligulate, acute, 9—12 inches long, bright grass-green above. Scapes as long as or longer than the leaves, sometimes branched, pale greenish purple, pubescent, few-flowered. Bracts triangular-lanceolate, acuminate, much compressed, 1—2 inches long. Flowers 1½—2 inches across, with all the segments covered with a soft velvety down; upper sepal oval-oblong, acute, keeled behind, greenish white stained with pale rose-pink; lower sepal broader, concave, whitish with pale green veins; petals oval-oblong, white spotted and stained with rose-purple, chiefly at the base; lip inflated, broadly ovoid in form, contracted at the aperture, rose-carmine, whitish beneath, the infolded lobes streaked alternately with white and rose-carmine. Staminode rhomboid with a minute median keel, bright yellow with a brownish stain in front.

Cypripedium Schlimii, Batem. in *Bot. Mag.* t. 5614 (1866). Van Houtte's *Fl. des Serres*, t. 1917 (1869—70). De Puydt, *Les. Orch.* t. 12. Selenipedium Schlimii, Rchb. in Bonpl. 1854, p. 277. Id. *Xen. Orch. I.* p. 125, t. 44. Linden's *Pesc.* t. 34.



Cypripedium Schlimii albiflorum.

var.—albiflorum.

Plant of somewhat more vigorous growth. Flowers white, except at the base of the petals, where there is usually a pale rose-pink stain, and the infolded lobes of the lip, which are rose-pink; the staminode bright yellow, as in the type.

C. Schlimii albiflorum, Linden in *Illus. hort.* 1874, t. 183. C. Schlimii album, Hort.

The original *Cypripedium Schlimii* was discovered by the traveller whose name it bears, in 1852, on the eastern Cordillera of New Granada, near Ocaña, at an altitude of about 4,000 feet. It was introduced to M. Linden's horticultural establishment at Brussels two years later by Wagener.* The variety *albiflorum,* according to Linden, comes from the western Cordillera, where "it is exceedingly rare"; † it was introduced about the year 1873. The flowers of this species vary in colour; in the first discovered type the sepals and petals are beautifully spotted and stained with rose-pink; in the variety they are almost pure white; between these extremes are many intermediate variations that have been introduced since.

It has long been known to horticulturists that *Cypripedium Schlimii* is self-fertilising, and produces seed freely; but it is only very recently that we have been able to partially investigate the cause, and therefore the explanation now offered is confessedly imperfect. The sexual apparatus of this species differs in no essential character from that represented in page 7, but, as is the case with all the Selenipedia, the relative position of the stigmatic disc to the other parts is somewhat modified; this disc is rhomboidal in outline, much thickened beneath, especially on the basal side, forming there a conical protuberance that stands immediately below the anthers, is nearly parallel with the staminode, and projects beyond it. The anthers are normal as regards form and position, but the glutinous envelope is exceedingly thin, loses its viscidity after the flower has been some time expanded, and becomes dry; the granular pollen is then set free upon any slight motion imparted to the flower; and as these granules are exceedingly minute and numerous, it can scarcely happen that some of them do not fall upon the stigmatic disc, especially the thickened part that projects immediately below the anthers, and the ovary thence becomes fertilised. The consequence to the plant is the enfeebling of its constitution, by which the species is one of the most difficult to import alive, and scarcely less difficult to keep alive when so imported. For some time after its first introduction, *C. Schlimii* was a very rare plant in British gardens, and horticulturists took advantage of its self-fertilising power to raise young plants from seed.

The excessive fertility of *Cypripedium Schlimii* is not only seen in the production of seed capsules without the intervention of any external help, but the species has also proved to be one of the most potent of hybridising agents. No orchid yet brought under cultivation has been the means of producing within its own section such remarkable results as have been effected by *C. Schlimii* through hybridisation, especially in those forms of which it has been the pollen parent, and in which its influence so greatly preponderates as to modify very considerably the characteristics of the seed parent; the number of beautiful and distinct forms so obtained constitute a group of Cypripedes of exceptional interest as horticultural plants. First came the well-known *C. Sedenii*, still an indispensable ingredient of every orchid collection, soon followed by *C. Ainsworthii* and its variety *calurum*;* then came *C. albo-purpureum*, now surpassed by the more superb *C. Schroederæ*, as is the original *C. Sedenii* by its variety *candidulum* and *C. cardinale.* Still later *C. leucorhodum* has been obtained, a form quite distinct from all its predecessors.

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* Xen. Orch. I. p. 125.

† Illus. hort. 1874, p. 138.

C. vittatum.

"Foliis lineari-ligulatis, acutis, longissimis; pedunculo minute ac sparsim puberulo, densim vaginato; vaginis acuminatis, racemo paucifloro, bracteis spathaceis acuminatis, ovaria subcaloa *(sic)*, hinc sparsim pilosula superantibus; sepalo dorsali oblongo ligulato, obtuse acuto; inferiori plus duplo latiori, apice obtuso minute emarginato; petalis a latiori basi linearibus arcuatis, obtuse-acutis, undulatis; labello sepalo inferiori multo breviori, supra saccum dilatato ac utrinque angulato, circa limbum argutum subcrenato; staminodio rhombeo acuto, postice barbato.—H. G. Reichenbach fil, in *Illus. hort. XXIII.* (1876), p. 57, t. 238 (Selenipedium vittatum).

Cypripedium vittatum, Vellozo. Fl. flum. IX. (1827), tab. 62, *fide Illus. hort. IV.* (1857), misc. p. 23. C. Binotii, Hort. Selenipedium vittatum, breve, Rchb. in Gard. Chron. XV. (1881), p. 656.

Our knowledge of this plant is derived chiefly from the description quoted above, and from the coloured plate in the *Illustration horticole.* As represented in the plate, the leaves have marginal yellow bands, the character which doubtless suggested the specific name; the flowers are about the size of those of *Cypripedium Lindleyanum,* evidently the nearest affinity of the species; the upper sepal is greenish white with some red spots along the veins on the basal area, the lower sepal pale green; the petals are deflexed, twisted, 2—3 inches long, pale green at the base, brownish purple for about two-thirds of the length from the apex; the lip is deep brown-purple with a greenish tinge, the infolded lobes pale green with a few rose-purple spots; the staminode is green with a blackish fringe behind.

Although known to science more than 60 years ago, *Cypripedium vittatum* does not appear to have been introduced into European gardens till a comparativaly recent date. It was imported by

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* For parentage of these and the following hybrids, see Selenipedium hybrids, *infra.*

M. Linden in 1875, and flowered, probably for the first time in Europe, in his nursery, in February of the following year; the first recorded notice of its appearance in England was in 1881, when it had been some time in cultivation in Mr. Berrington's garden, at Pant-y-Goitre, near Abergavenny.* More recently it has been sparingly distributed among other collections, chiefly through M. Binot, a French collector of Brazilian orchids, who obtained it from the Organ Mountains; it is thence, geographically speaking, so far as at present known, a remotely outlying member of the genus.

HYBRID CYPRIPEDIUMS.

In our introductory notes we have adduced the principal evidence upon which rests the hypothesis that the flowers of Cypripedium in a state of nature rarely produce seed, owing to the absence generally of the agencies by which they can be fertilised. Under such circumstances, therefore, natural hybrids cannot be expected to occur, even where two species are found growing intermixed or in close proximity to each other; and it is a remarkable fact—a fact that unquestionably tends to strengthen the evidence we have cited, circumstantial as it is in some points—that no Cypripedium having the aspect of being a natural hybrid between two recognised species has ever yet appeared among importations of the species, as undoubted natural hybrids have appeared among importations of Cattleya, Lælia, and Odontoglossum. In strong contrast to this stands the multitude of hybrids raised artificially in the glass houses of Europe, among which are new forms of exceptional interest, and of so vigorous a constitution that they may, in truth, be regarded as the forerunners of new races. Without attempting to anticipate results to be hereafter obtained from the intermixture of these races with each other and with the pure species, it may be safely affirmed that no greater triumph has been achieved in modern times by the gardeners' art than the production of these hybrid Cypripedes.

The first hybrid Cypripedium was raised by Dominy, from *Cypripedium villosum* and *C. barbatum*, more than a quarter of a century ago, at our Chelsea Nursery, and was distributed in 1871; it is appropriately named *C. Harrisianum*, in compliment to the late Dr. Harris, of Exeter, who first suggested to Dominy the feasibility of hybridising and raising orchids from seed. This was followed at short intervals by *C. Dominianum* and *C. vexillarium.* The first seedling raised by Seden is the well-known hybrid that bears his name, and which was distributed in 1874; this has been followed up to the present time by an uninterrupted series of results which, apart from successes obtained in other genera, has secured for the raiser's name a permanent place amongst British hybridists.

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* Gard. Chron. XV. (1881), p. 656.

We may here note a few interesting facts that have been elicited during the course of our experience in the crossing of Cypripedes:—*Cypripedium Sedenii* was obtained from two crosses, *C. Schlimii* × *C. longifolium* and the same two *vice versâ:* no tangible difference was discernible between the plants raised from the two separate crosses; they agreed in habit, foliage, colour of flower, in fact in every particular. No similar result has been obtained by us among Cypripedes; not only do the seedlings raised from a *vice versâ* cross between the same two species vary from those produced from the first cross, but also it is not an unusual occurrence for the seedlings obtained from a single cross, especially if one of the plants is itself a hybrid, to vary considerably, *inter se*, but the variability is restricted chiefly, if not entirely, to the colour of the flowers; a conspicuous instance of this is seen in *C. œnanthum* (Rchb.), *C. Thibautianum* (Rchb.), *C. Galatea* (Rolfe), *C. Orestes* (Veitch), all of which were obtained from the hybrid *C. Harrisianum* × *C. insigne Maulei.* We have on the other hand an instance of a species and its variety, each being crossed by a second species, both crosses producing like but not identical results, thus *C. longifolium* × *C. Schlimii* produced *C. Sedenii* (Rchb.), and *C. longifolium* var. *Hartwegii* (*Roezlii*) × *C. Schlimii* produced *C. porphyreum* (Rchb.); the two are scarcely distinguishable except, as might be expected, the last named is the more robust of the two, and its flowers of a somewhat brighter pink. It need scarcely be noted that this fact alone offers sufficient justification for the reduction of *C. Hartwegii* (Lindl.) *Roezlii* (Rchb.) to its proper rank.*

In their vegetation the hybrids of Cypripedium are more or less intermediate between the two parents, but it is not an unusual occurrence for the form of the vegetative organs of one parent to greatly preponderate in the progeny, or for the progeny to be more robust in habit than either parent (*e.g.*, *Cypripedium grande*, *C. selligerum majus*). It is also worthy of a remark, from a cultural point of view, that when one parent is a weakly plant and difficult to manage, the progeny is not thereby affected; thus *C. Schlimii* is always considered to be a plant of delicate constitution in the orchid houses of Europe, while its progeny, *C. Sedenii* and its allies are among the most robust. *C. Fairieanum* seems to be one of the most difficult species to cultivate successfully, but *C. vexillarium* and *C. Arthurianum*, of which it is the pollen parent, are among the easiest.

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* *See* also "Hybridisation of Orchids," by H. J. Veitch, Orchid Conference Report, 1885. Journal of the Royal Horticultural Society.

The remarkable hybrids raised by Dominy and Seden soon afforded an incentive to other operators; their results, subject to the restrictions to be presently noticed, are duly recorded in the following pages. It is, however, only within the last few years that the raising of hybrid Cypripedes has become general among professional and amateur cultivators. That they have been more attracted to Cypripedium than to any other genus in the great orchidean family is doubtless due to several causes, the foremost being the comparative facility with which seed capsules are produced by cross fertilisation, the greater proportion of the mature seed that germinates, and the shorter period of time that elapses between the germination of the seed and the flowering of the plant. So generally is muling among Cypripedes now practised, not only in Great Britain, but also on the Continent of Europe, and in the United States of America, that there is scarcely an orchid collection of note in which a batch of seedlings may not be found; such at least may be said to be the general rule but there are many prominent exceptions; it has thence resulted that the actual number of hybrid Cypripedes has become practically indefinite.*

As the paramount object of hybridisation is the production of new and *improved* races, it is unavoidable that when the progenies so raised have become very numerous, they can be otherwise than of a very mixed character, which must ultimately lead to a PROCESS OF SELECTION amongst the individuals, by which the more perfect forms with the most attractive colours will be retained, and the inferior forms with unattractive colours will be rejected. No horticulturist of any experience doubts for a moment that the process of selection will eventually be far more rigorously applied to the artificially-raised seedlings of Cypripedium than hitherto, and that most of the unattractive and uninteresting forms that now encumber the stages of many orchid houses are doomed to disappear before the exigences of a higher standard of excellence than they represent.

In dealing with the numerous hybrids that have flowered up to the time of going to press, we have found it impracticable to give descriptions of all that have been announced. We have, therefore, confined ourselves to the insertion of all those of undoubted parentage which we consider most distinct and which we have seen, and to some others that have been authoritatively described in the horticultural press, but which not having yet been seen by us are distinguished by an asterisk, thus (*); we have also included a few others of doubtful parentage that are too distinct to be passed over.* With a view of bringing before the reader their chief characteristics more clearly than can be done by verbal description, we have sketched below a scheme of classification or grouping, by which all the closely allied forms are brought together, selecting for the type of each group the first described hybrid of it. The leading principle that has guided us in this grouping—which has no pretentions to a scientific basis—being the strong *family likeness* that pervades the series of hybrids included in each group, and which has been derived from one of the species used either as ♂ or ♀ parent throughout. Although the groups are fairly distinct as such, it is evident that other crosses, whether already effected or which will be hereafter effected between members of different groups, must tend to break down the distinctive characters set up between each, so that the grouping as now proposed can at best be only regarded as temporary, but it may nevertheless suggest the basis of a rational classification for *horticultural* use. To diminish in some degree the confusion that has arisen from the application of separate names to hybrids raised from the same cross by different operators, we have reduced all such to varieties of the first applied name.

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* It cannot fail to be evident to every unprejudiced reader that as the raising of hybrids is a purely horticultural process, the naming of them cannot be said to come exclusively within the province of the botanist, and that the pseudo-latin names so much in vogue, together with the cumbrous Greek compounds intelligible to none but the initiated, are as much out of place when applied to hybrid Cypripedes as they would be if applied to hybrid Roses, etc. A simple English nomenclature, avoiding personal names except those of the highest distinction or derived from mythology, literature and fiction, is alike dictated by common sense and practical convenience.

PROPOSED CLASSIFICATION OF CYPRIPEDIUM HYBRIDS.

A.—Eucypripedium Hybrids.

(1) **Harrisianum Group.**

Cypripedium villosum one parent throughout. Flowers solitary, large, with the inner surface glossy as if varnished; upper sepal broad, with a pale margin; petals spathulate, that is, broader towards the apex than towards the base, more or less curved inwards.

- apiculatum
- concinnum
- Charles Canham
- Germinyanum
- Godseffianum
- Harrisianum
  - atropurpureum
  - Bray's
- Harrisianum
  - Dauthier's
  - hybridum
  - purpurascens
  - superbum
  - vivicans
- Lathamianum

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* "If we continue to obtain hybrids of uncertain parentage, we may, botanically speaking, sink down to a very deep level."—Reichenbach in Gard. Chron. I. s. 3 (1887), p. 447. "Many hybrid Cypripediums bear rather too close a resemblance to each other."—Williams' Orch. Alb. V. sub. t. 223.

- Measuresianum
  - Amesianum
- Mrs. Charles Canham
- vernixium
- Williamsianum
- Winnianum.

(2) Œnanthum Group.

Cypripedium Harrisianum and *C. insigne* or one of its varieties, the parents throughout. Leaves faintly mottled. Flowers solitary, somewhat smaller than those of the preceding group, with a lustrous shining surface, and well distinguished by their bright and varied colours.

- œnanthum
  - Acis
  - Electra
  - Galatea
  - Josephine Jolibois
- œnanthum
  - Orestes
  - superbum
  - Thibautianum.

(3) Ashburtoniæ Group.

Cypripedium insigne one parent throughout. Flowers solitary, large, with the general aspect of *C. insigne*, especially the broad green upper sepal with white margin, the veining and spotting of the green area much modified by the influence of the other parent.

- Arthurianum
- Ashburtoniæ
  - calospilum
  - expansum
  - majus
- Ashburtoniæ
  - superbum
- Laforcadei
  - Bartet's
- nitens
- Sallieri.

(4) Superciliare Group.

Cypripedium barbatum or one of its nearest affinities (*Argus*, *Dayanum*, *Lawrencianum*, *superbiens*, etc.), one parent throughout. Leaves more or less distinctly tesselated. Flowers solitary, and usually medium-sized; upper sepal broad and symmetrically veined; petals ciliate and more or less warty; staminode semilunate.

- almum
- delicatulum
- Euryale
  - Vervaetianum
- gemmiferum
- Io
- javanico-superbiens
- marmorophyllum
- orphanum
- pleistochlorum
- superciliare
- Swanianum.

(5) Crossianum Group.

Cypripedium venustum one parent throughout. Leaves tesselated above, more or less speckled with dull purple beneath. Flowers solitary and usually under medium size, with the characteristic venation and colour of *C. venustum*; upper sepal more or less acuminate; petals sub-spathulate, fringed with blackish hairs and with a few scattered blackish warts, chiefly on the basal half.

- auroreum
- caligare
- calophyllum
- Carrierei
- chloroneurum
  - discolor
  - Meirax
  - melanophthalmum
- chloroneurum
  - politum
- Crossianum
  - amandum
- Fitchianum
- pavoninum
- plunerum
- Thetis.

(6) **Marshallianum Group.**

Cypripedium concolor or the closely allied *C. niveum* one parent throughout. Leaves short and spreading, mottled pale and deep green above, speckled or stained with dull purple beneath. Scapes 1—3 flowered. Flowers with broadly oval upper sepal, broad, obtuse, deflexed petals, and a more or less inflated, sometimes compressed lip.

- Aphrodite
- Madame Van Houtte
- Marshallianum
- microchilum
- Tautzianum
- tesselatum porphyreum.

(7) **Leeanum Group.**

Cypripedium Spicerianum, one parent throughout. Flowers solitary, above medium size; upper sepal broad, folded at the mid-vein, more or less bent forward at the apex and with the margin revolute at the base; petals incurved, more or less undulate at the margin.

- Hornianum
- Leeanum
  - superbum
- polystigmaticum
- radiosum
  - variopictum
- Savageanum
- Seegerianum.

(8) **Selligerum Group.**

Cypripedium Lowii, or one of its nearest affinities (*philippinense*, *Stonei*, etc.), one parent throughout. Scapes 3—5 or more flowered. Flowers large with ciliate segments; petals narrow, elongated, more or less twisted and pendulous.

- calanthum
- euryandrum
- macropterum
- Morganiæ
- Peetersianum
- pycnopterum
  - porphyrospilum
- selligerum.

(9) Hybrids not referable to any of the preceding groups:—

- Fraseri
- Porphyrochlamys
- vexillarium.

B.—SELENIPEDIUM HYBRIDS.

(1) Sedenii Group.

Cypripedium Schlimii participates in the parentage throughout, in most cases *directly*, in others through *C. Sedenii.* Leaves strap-shaped, and of a uniform grass-green. Flowers generally medium-sized and of various shades of rose-pink suffused with white; upper sepal longer than broad; lower sepal concave, larger than the upper one; petals bearded at the base, more or less twisted, sometimes elongated and pendulous.

- albo-purpureum
- Ainsworthii
  - calurum
- cardinale
- leucorhodum
- Saundersianum
- Schroederæ
- Sedenii
  - albanense
  - candidulum
  - porphyreum
- stenophyllum.

(2) Dominianum Group.

Cypripedium caudatum one parent throughout, with (at present) one exception, in which it is replaced by *C. caricinum.* Leaves strap-shaped, of a uniform bright green. Sepals elongated, the upper one undulate, acuminate, the lower one larger and concave; petals still more elongated, taking the form of pendulous ribbon-like tails.

- conchiferum
- Dominianum
- grande
- nitidissimum.

For convenience of reference, the descriptions of the hybrids in each division are given in alphabetical order.

EUCYPRIPEDIUM HYBRIDS.

Cypripedium almum.

C. barbatum × *C. Lawrenceanum*, or *vice versâ.*

Upper sepal white with a vinous stain near each lateral margin, the central veins alternately longer and shorter, deep green, the side veins broader, deep purple; lower sepal white, with 2—3 purple streaks; petals deep greenish brown, tinted with purple at the apex, and with numerous small black warts at each margin; lip deep bronzy purplish brown, the infolded lobes pale green, spotted with dull purple.

Cypripedium almum, Rchb. in Gard. Chron. I. s. 3 (1887), p. 512. C. Cooksonianum, Hort.

Raised by Mr. Norman C. Cookson, of Oaklands, Wylam-on-Tyne.

C. Aphrodite.

C. niveum × *C. Lawrenceanum.*

Plant dwarf and compact. Leaves oval-oblong, 3 inches long, and 1½ inches broad, uniformly tesselated with light and dark green. Flowers white spotted and stained with rose-purple, the sepals and petals with a greenish stain at the base; upper sepal orbicular; lower sepal smaller, ovate, concave; petals slightly deflexed, broadly oblong, fringed with minute blackish hairs; lip inflated with contracted aperture. Staminode pale rose with a green reticulation in the centre.

Cypripedium Aphrodite, supra.

Raised by Seden at our nursery. This hybrid is one of the handsomest of the group in which we have placed it; its foliage is scarcely less striking than its flowers, and is the most ornamental yet seen in the genus.

C. apiculatum.

C. barbatum × *C. villosum Boxalli.*

Leaves faintly tesselated. Upper sepal light green, with broad, blackish purple anastomosing veins and a whitish margin; lower sepal pale green with brown veins; petals with a broad red-brown median vein, the superior half brown-purple, the inferior half yellowish green, with numerous small blackish spots; lip yellow-brown, much paler beneath.

Cypripedium apiculatum, Rchb. in Gard. Chron. XXV. (1886), p. 617.

Raised by Mr. D. O. Drewett, of Riding, near Newcastle-on-Tyne.

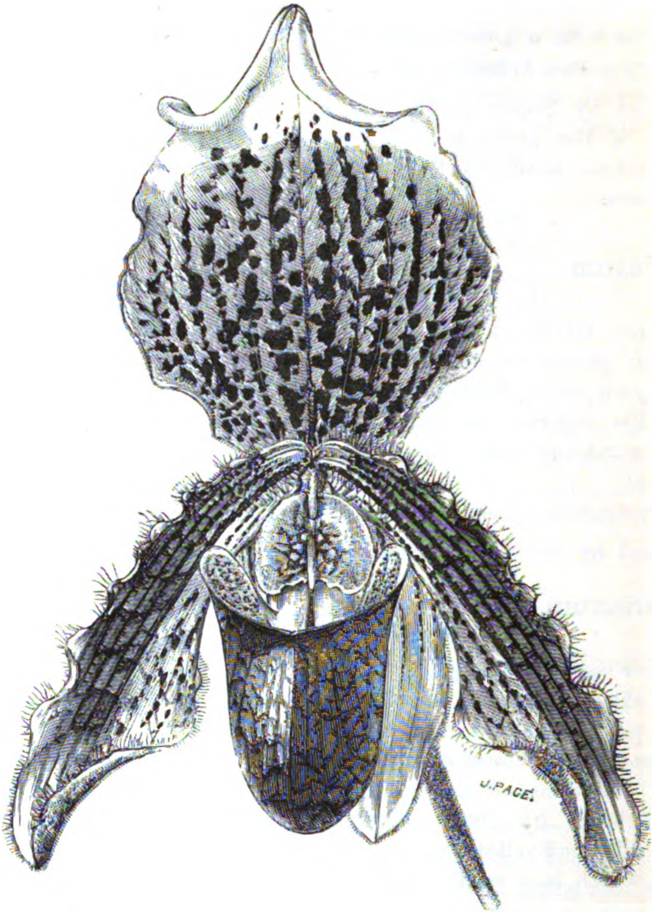
C. Arthurianum.

C. insigne × *C. Fairieanum.*

Upper sepal apple-green with a broad white apical margin, veins brownish purple along which are numerous brown-purple spots; lower sepal paler with but few spots; petals deflexed and recurved as in *Cypripedium Fairieanum*, with ciliate and undulate margins, light yellow-green, the veins of the superior half purplish brown, of the inferior half lighter; lip light yellow-green mottled and veined with brown. Staminode buff-yellow with a bright green reticulation in the centre, below which is a small glandular yellow boss.

Cypripedium Arthurianum, Rchb. in Gard. Chron. II. (1874), p. 676. Godefroy's *Orchidophile*, 1887, p. 209.

The only seedling obtained from the cross was raised at our Chelsea Nursery; this was dedicated by Professor Reichenbach to the late Mr. Arthur Veitch. In this hybrid the influence of the pollen parent is quite subordinate; it is seen chiefly in the depressed, recurved petals, and in the staminode, which is but a slight modification of that of *Cypripedium insigne;* in every other organ the characters of seed parent entirely predominate. *C. Arthurianum* is, nevertheless, one of the most distinct hybrid Cypripedes yet raised; this is particularly manifest in the broad upper sepal, in which the apical margin is of the purest white, and the spotting of the central area most distinct; the colour of the petals too is equal to that of the best *C. insigne* forms, while the markings of the lip are quite characteristic.



Cypripedium Arthurianum.

C. Ashburtoniæ.

C. barbatum × *C. insigne.*

Upper sepal apple-green with brown veins and with a broad white apical margin; lower sepal paler, sometimes with deeper green veins, sometimes with pale brown veins; petals with ciliolate margins, reddish brown with brown veins, paler at the base where there are a few blackish warts; lip reddish brown, paler beneath. Staminode buff-yellow, with green markings in the centre.

Cypripedium Ashburtoniæ, Rchb. in Gard. Chron. 1871, p. 1647. Regel's *Gartenfl.* 1879, t. 976. C. obscurum, Gard. Chron. I. s. 3 (1887), p. 8.

var.—expansum.

Upper sepal broader and nearly flat, the spots on the veins larger and deeper in colour, the white apical margin prolonged more than half-way down each side.

C. Ashburtoniæ expansum, Rchb. in Gard. Chron. XXII. (1884), p. 552.

var.—majus.

Plant more robust with broader leaves. Flowers much larger, the upper sepal with a faint flush of vinous purple below the white apical border.

C. Ashburtoniæ majus, supra.

sub-vars. (distinguished by colour only).—*calospilum*, white, border of upper sepal prolonged to the base on each side, the spots on the veins more sharply defined and of a deeper colour; *superbum*, white border of upper sepal broader and the spots within it of a bright mauve-purple like those of *C. insigne Chantinii.*

The original *Cypripedium Ashburtoniæ* and its variety *expansum* were raised by the late Mr. Cross, gardener to Louisa Lady Ashburton, at Melchet Court, near Romsey. The variety *majus* was obtained from a separate cross by the late Dr. Harris of Lamberhurst, Kent, who is supposed to have used *C. barbatum Crossii* for one parent. The two sub-varieties are handsome and distinct; the first named was raised by Mr. Fraser, of Derncleugh, near Aberdeen, from the same cross as the original *C. Ashburtoniæ.* In all the forms the influence of the pollen parent is manifest, especially in the upper sepal, lip and staminode.

C. auroreum.

C. Lawrenceanum × *C. venustum.*

Upper sepal white, sometimes with a rose-purple stain near each lateral margin, veins close set, alternately longer and shorter, the middle ones green, the outside ones purple; lower sepal white with pale green veins; petals with 3—5 hairy warts at each margin and some smaller ones on the mid-vein, basal portion pale green, apical portion dull red-purple; lip greenish brown, the infolded lobes buff-yellow spotted with rose. Staminode with deep green central reticulations.

Cypripedium auroreum, Rchb. in Gard. Chron. I. s. 3 (1887), p. 179.

Raised by Mr. Norman C. Cookson, of Oakwood, Wylam-on-Tyne.

C. calanthum.

C. barbatum Crossii × *C. Lowii.*

Upper sepal greenish brown bordered with white, veins brown; lower sepal pale green; basilar portion of petals pale green with some blackish purple spots, apical portion purplish rose; lip with a lustrous surface, purplish brown, the infolded lobes purplish. Staminode white and brown.

Cypripedium calanthum, Rchb. in Gard. Chron. XIV. (1880), p. 652.

Raised by Seden at our nursery.

C. caligare.*

C. venustum × *C. Dayanum.*

"Upper sepal whitish with green veins; lower sepal also whitish, with fewer green veins; petals with a dark purple median-vein on which are a few black spots at the base, superior half purple with deeper veins and some blackish warts at the margin, inferior half whitish with green veins; lip brownish, the infolded lobes spotted with shining warts."

Cypripedium caligare, Rchb. in Gard. Chron. III. s. 3 (1888), p. 264.

Raised by Mr. D. O. Drewett, of Riding, Mill-on-Tyne.

C. calophyllum.

C. barbatum × *C. venustum.*

Upper sepal white with green veins; lower sepal similar with the veins paler; basal portion of petals light green with a few blackish warts along the brown-purple mid-vein and at each margin, apical portion rose-purple; lip brownish purple. Staminode green with some deep purple spots on the front side.

Cypripedium calophyllum, Rchb. in Gard. Chron. XV. (1881), p. 169.

"One of the oldest artificial hybrids, having been gained at the Royal Exotic Nursery a long time ago. Accidentally it was never described, and now it comes from a second source—Mr. B. S. Williams." Rchb. in Gard. Chron., *loc. cit. supra.*

C. Carrierei.*

C. superbiens × *C. venustum.*

"Upper sepal white with green veins; (lower sepal not described); basal portion of petals pale green with deeper green veins and some blackish warts placed chiefly along the mid-vein, apical portion purplish red with a few scattered blackish warts; lip greenish stained with purple, veins deep green, the infolded lobes spotted with purple warts. Staminode green."

Cypripedium Carrierei, Moniteur d'Horticulture, March 10th, 1887.

Raised by M. Bauer at the Etablissement de la Muette, Paris.

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* Not seen by us.

C. Charles Canham.

C. villosum × *C. superbiens.*

Leaves 6—9 inches long, faintly tesselated with light and dark green. Flowers as large as those of *C. villosum*; upper sepal whitish with a dark purple mid-line, and longitudinal stripes that are brown-purple at the base, passing into green upwards; lower sepal whitish with green veins; petals ciliate, the mid-vein deep purple, the other veins yellow-brown, with numerous dark purple spots arranged along them; lip brown-purple in front, paler beneath. Staminode nearly as in *C. superbiens.*

Cypripedium Charles Canham, Rolfe in Gard. Chron. II. s. 3 (1887), p. 490.

A splendid acquisition, of which Mr. Rolfe observes: "The parents are both noble species, and a hybrid between them could scarcely be disappointing in any case, but in this one the result even surpasses the expectation." Although the flower of this hybrid is of the size and general outline of that of *Cypripedium villosum,* the influence of the pollen parent very decidedly predominates in the foliage, in the upper sepal, and especially in the staminode which shows no appreciable approach to the large and more elongated form of *C. villosum.*

C. chloroneurum.

Parentage doubtful; supposed to be *C. barbatum* × *C. venustum*, or *vice versâ.*

Upper sepal green with a white margin, the mid-vein purple, the other veins of a deeper green than the ground colour; lower sepal paler green than the upper one; petals with a broad dark purple mid-vein, the superior half purplish brown with some blackish warts towards the base, the inferior half green; lip greenish brown stained with purple in front, except the margin of the aperture, which is buff-yellow. Staminode pale green, mottled with deep green.

Cypripedium chloroneurum, Rchb. in Gard. Chron. XIV. (1880), p. 525. Williams' *Orch. Alb. I.* t. 37.

Raised by Mr. Robert Warner, of Broomfield, near Chelmsford. *Cypripedium chloroneurum*, *C. discolor*, *C. Meirax*, *C. melanophthalmum*, and *C. politum*, "a batch raised some few years since,"* are believed to have resulted from the same cross; they are therefore properly but varieties of one type. In all of them the influence of *C. venustum* strikingly preponderates.

C. concinnum.

C. villosum × *C. purpuratum*, or *vice versâ.*

Upper sepal with reflexed lateral margins, central and basal area purplish, apical area light green, lateral reflexed margins white, veins close set, blackish purple; lower sepal white with green veins; petals depressed, the mid-vein deep purple, superior half purplish brown with green veins, inferior half paler; lip dull pale purple. Staminode brownish with green centre.

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* Williams' Orch. Alb. I. sub. t. 36.

Raised by Mr. J. C. Bowring, of Forest Farm, near Windsor, to whom the authority for the name is unknown.

C. Crossianum.

C. insigne × *C. venustum.*

Upper sepal light apple-green with a broad white apical margin, veins deeper green with some blackish brown spots along them towards the base; lower sepal greenish white with green veins; petals yellowish brown, except the pale green base where there are some brown spots, the mid-vein red-brown, the other veins paler, greenish brown; lip greenish brown, with distinct veinings and reticulations; infolded lobes and staminode buff-yellow.

Cypripedium Crossianum, Rchb. in Gard. Chron. 1873, p. 877.

Raised by the late Mr. Cross, gardener to Louisa Lady Ashburton, at Melchet Court, near Romsey. The influence of the pollen parent is less marked in this hybrid than in any of the members of the group of which it is the type; compared with them the flowers are larger, with the prevailing green colour of *Cypripedium venustum* much subdued; the upper sepal is more rotund and scarcely acuminate, and the petals are more broadly spathulate. To *C. Crossianum* must be referred *C. amandum* (Gard. Chron. I. s. 3 (1887), p. 174), which we have not seen, but which has been obtained by Mr. Bowring, of Forest Farm, near Windsor, from the same cross. From the published description it would seem to differ but very little from *C. Crossianum.*

C. delicatulum.*

C. Dayanum × *C. barbatum Crossii (Warnerianum).*

"Upper sepal white with green veins and with a purplish stain near each lateral margin; lower sepal white with green veins; petals deflexed, brownish purple with a deep purple mid-vein, and with some spots at the base on the superior side of it, the other veins green;" (lip not described).

Cypripedium delicatulum, Rchb. in Gard. Chron. II. s. 3 (1887), p. 552.

Raised by Mr. D. O. Drewett, of Riding, Mill-on-Tyne. This must be near *Cypripedium Swanianum* raised from the same parentage, except that *C. barbatum Crossii (Warnerianum)* was used by Mr. Drewett in the place of the typical *C. barbatum.*

C. discolor.*

Parentage doubtful; supposed to be from the same cross as *C. chloroneurum.*

"Upper sepal pale green with alternate deep green and purple veins;

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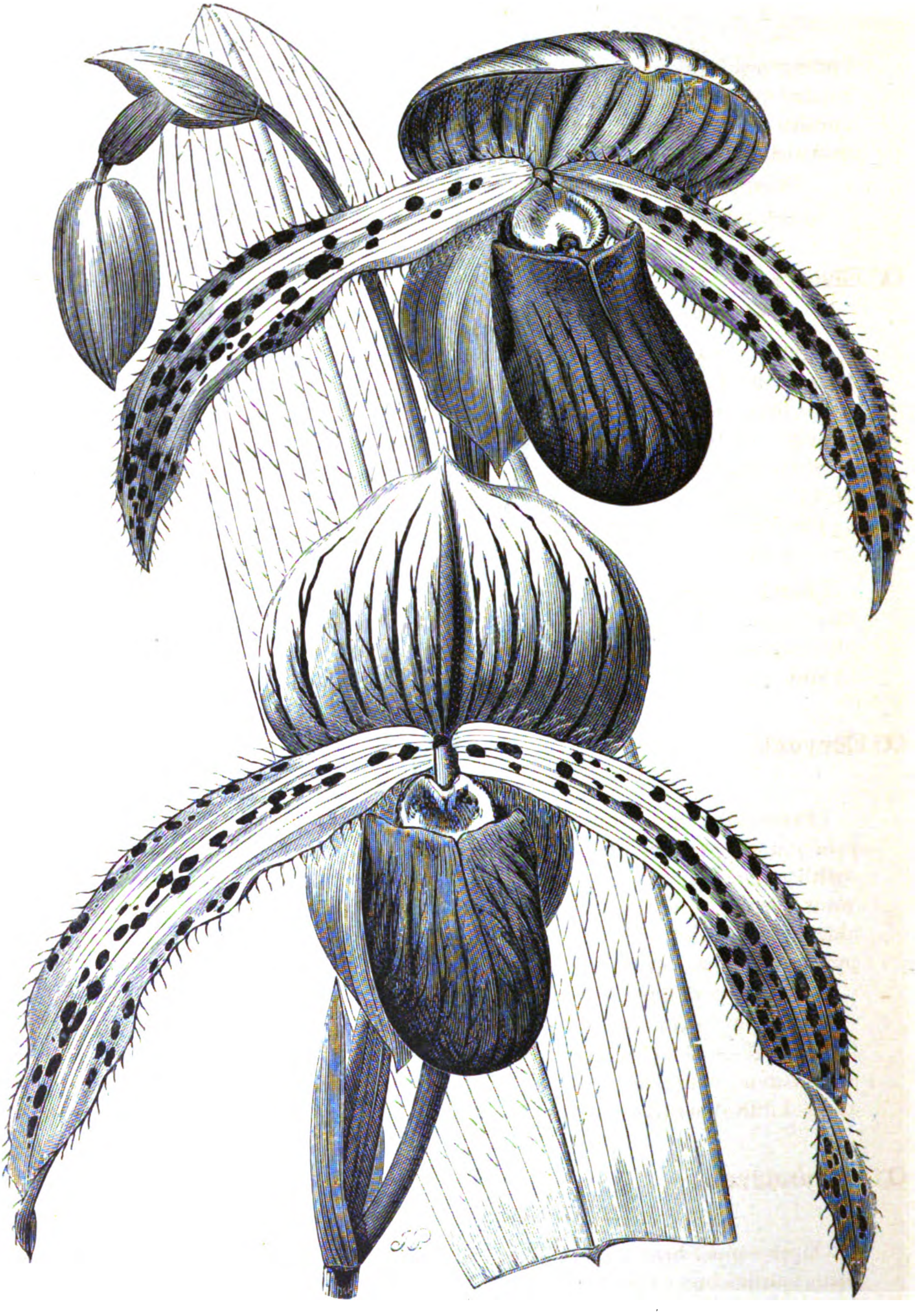
* Not seen by us.



Cypripedium euryandrum.

lower sepal pale green with darker veins; basal portion of petals green spotted with purple, apical portion pale purplish rose; lip reddish brown mottled with yellow-green. Staminode pale green with darker green reticulations."

Cypripedium discolor, Rchb. in Gard. Chron. XVII. (1882), p. 218.

Raised by Mr. Robert Warner, of Broomfield, near Chelmsford.

C. Electra.

C. Harrisianum × C. sp., probably *C. insigne Maulei.*

Upper sepal apple-green with a very broad white border, the central area with blackish brown spots that are arranged in lines along the veins, and often confluent; lower sepal pale green with a few blackish spots chiefly on the mid-vein; petals veined and reticulated with brown-purple on a paler ground, and with a few small dark spots on the inferior side of the mid-vein near the base; lip brownish purple. Staminode dull yellow with the characteristic tooth of *C. insigne.*

Cypripedium Electra, Rolfe in Gard. Chron. III. s. 3 (1888), p. 297.

Raised by Seden, at our nursery. There is some uncertainty respecting its origin; it is probably an escape from the pot in which the seedlings of *Cypripedium œnanthum* were raised. Although very distinct from that hybrid in colour, it can only be regarded as a variety of it.

C. Euryale.

C. Lawrenceanum × *C. superbiens.*

Leaves handsomely tesselated. Upper sepal white with a faint flush of pale purple towards the lateral margins, veins green; lower sepal white with pale green veins; petals but slightly deflexed, green with deeper veins, purplish at the tips, and with interrupted lines of blackish warts along the mid-vein and both margins, the latter being hairy; lip purplish brown, greenish beneath. Staminode pale green.

Cypripedium Euryale, supra.

Raised by Seden at our nursery. *Cypripedium Vervaetianum* (Gard. Chron. III. s. 3 (1888), p. 712), raised from the same cross, is a later acquisition. Our plants were distributed twelve months before the appearance of the description quoted.

C. euryandrum.

C. barbatum × *C. Stonei.*

Upper sepal broad, almost orbicular, centre green with deep green veins, pale purple on each side of it with deep vinous purple veins, apical border white; lower sepal much smaller and paler in colour; petals yellowish green with numerous blackish warts, and tinted with vinous purple towards the apex; lip brownish purple. Staminode yellowish with green markings.

Cypripedium euryandrum, Rchb. in Gard. Chron. IV. (1875), p. 772. *Fl. Mag.* n. s. t. 187 (New Hybrid). Van Houtte's *Fl. des Serres XXII.* t. 2278. Williams' *Orch. Alb. VII.* t. 301.

Raised by Seden at our nursery. Well known as one of the most distinct of its race.

C. Fitchianum.*

C. Hookeræ × *C. barbatum* (?)

"Upper sepal greenish white streaked with lines of deep green; lower sepal similar but smaller; basal portion of petals bright green with deeper green veins passing upwards into dull purplish red, and with a few blackish warts; lip yellowish green veined with deep green and suffused with dull purple. Staminode greenish yellow reticulated with deep green."

Cypripedium Fitchianum, Williams' *Orch. Alb. VIII.* t. 350.

Origin not recorded.

C. Fraseri.

C. hirsutissimum × *C. barbatum*, or a closely allied species.

Raised by Mr. Fraser, of Derncleugh, near Aberdeen, from whom we acquired the only plant saved. The only flower we had was sent to Professor Reichenbach, which, unfortunately, reached its destination during his absence, and became too much withered before any description could be taken. The name was given by the Professor, who subsequently wrote for more materials, which we were unable to supply.

C. Galatea.

C. Harrisianum × C. sp., probably *C. insigne Maulei.*

Central and basal area of upper sepal primrose-yellow densely spotted with brown, the spots being generally in the direction of the veins, and often confluent, particularly in the central lines, margin pure white, carried right round to the base; lower sepal pale primrose-yellow with a few small spots towards the base; petals slightly depressed, ciliate at the margin, and with a red-brown mid-vein; the superior half reddish brown, the inferior half much paler, the basal portion on both sides of the mid-vein spotted with purple; lip yellow-brown with deeper veins and reticulations. Staminode with the characteristic tooth of *Cypripedium insigne.*

Cypripedium Galatea, Rolfe in Gard. Chron. III. s. 3 (1888), p. 168.

Raised by Seden at our nursery. It is of the same origin as *Cypripedium Electra* and *C. Orestes*, and was the first of the three that flowered.

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* Not seen by us. There is evidently an error in the parentage given for this hybrid; the coloured plate in the *Orchid Album* shows plainly that *Cypripedium venustum* must have been one parent.

C. gemmiferum.

C. Hookeræ × C. purpuratum.

Upper sepal white with rather close-set green veins; lower sepal white with paler green veins; basal half of petals green, very pale on the inferior side of the mid-vein, and with 7—10 small blackish warts at the superior margin, apical half pale purple; lip brownish purple, the infolded lobes pale green spotted with dark purple. Staminode pale green with deep green spots.

Cypripedium gemmiferum, Rchb. in Gard. Chron. XV. (1881), p. 814.

Raised by Mr. J. C. Bowring, of Forest Farm, near Windsor.

C. Germinyanum.

C. villosum × C. hirsutissimum.

Flowers nearly as large as those of *Cypripedium villosum*, with all the segments fringed with short white hairs; upper sepal brown bordered with yellowish green, the brown area densely spotted with black; lower sepal pale yellowish green; basal half of petals much undulated at the margin, pale vinous red above the dark mid-vein, pale yellow-green below it, dilated apical half pale violet-purple; lip brown-purple in front, green beneath. Staminode yellowish green.

Cypripedium Germinyanum, Rchb. in Gard. Chron. XXV. (1886), p. 200.

Raised by Seden at our nursery. It is dedicated to Count Adrien de Germiny, of Gouville, near Rouen, the possessor of one of the finest collections of orchids in France. Although we have placed it in the *Harrisianum* group, the influence of the pollen parent is so decided that some of the most obvious *Cypripedium villosum* characters which predominate throughout that group are here almost obliterated. It is an exceptionally distinct hybrid.

C. Godseffianum.*

C. villosum Boxalli × C. hirsutissimum.

"Upper sepal light yellow toned with sepia-brown, except at the margin and at the base, where there are some dark brown spots; lower sepal pale yellow with some rows of dark spots in the centre; basal portion of petals undulate at the margin, yellowish, densely spotted, distal dilated portion mauve-purple; lip pale brown, yellowish beneath. Staminode yellow."

Cypripedium Godseffianum, Rchb. in Gard. Chron. III. s. 3 (1888), p. 296.

Raised by Mr. Norman C. Cookson, of Oakwood, Wylam-on-Tyne.

C. Harrisianum.

C. villosum × C. barbatum.

Leaves 6—10 inches long, tesselated with dark and bright grass-green. Upper sepal deep vinous, almost blackish purple, passing into green near the apex, margin white, veins close-set, blackish; lower sepal pale green with deep green veins; petals with a blackish purple mid-vein, the superior half brown-purple with dark purple veins, the inferior half light buff-yellow with green veins; lip pale purple with deeper veins and reticulations, in front pale yellow-green with green veins beneath. Staminode dull pale brown tinged with green.

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* Not seen by us.

Cypripedium Harrisianum, Rchb. in Gard. Chron. 1869, p. 108. Fl. and Pomol. 1871, p. 56, icon. xyl. Van Houtte's *Fl. des Serres, XXII.* t. 2289—90.

var.—superbum.

Flowers much larger, with a more glossy surface, and with all the segments more richly coloured.

C. Harrisianum superbum, supra.

sub-vars. (distinguished by colour only).—*atropurpureum*, upper sepal and base of petals blackish purple, lip deep purple in front; *Bray's*, flowers lighter in colour, the usual blackish purple of the upper sepal confined to the mid-vein and shorter veins on each side of it, the inter-spaces being light green; *Dauthier's*, upper sepal with central area brownish, merging into green towards the base and apex, the other segments of the flower paler than in the typical *Cypripedium Harrisianum; hybridum*, upper sepal light yellow-green, the veins blackish for two-thirds of their length from the base, the apical third bright green, petals paler and the lip deeper in colour than in the type; *purpurascens*, the veins next the lateral margins of the upper sepal bright vinous purple, the colour spreading over the inter-spaces and into the white margin; *vivicans*, apical area of upper sepal bright apple-green, petals of a deeper colour than the type.

The original *Cypripedium Harrisianum* was raised by Dominy, about the year 1864, at our Chelsea Nursery, where it flowered for the first time in 1869. It is the first Cypripedium raised by hand, and has since been obtained by several operators from the same cross. Among the progenies so raised have originated many of the sub-varieties to be met with in the various orchid collections of Europe. The variety *superbum* is one of the original seedlings; it is distinguished by its more robust growth, larger leaves and much larger and more handsome flowers.

C. Hornianum.*

C. Spicerianum × *C. superbiens*, or *vice versâ.*

"Leaves tesselated. Upper sepal white with a deep purple mid-line, a yellow-green blotch at the base, on which are a few lines of blackish purple spots; (colour of lower sepal not given); petals depressed, undulate at the upper margin, light green tinged with light purple at the margin, and with numerous blackish spots along the mid-vein and

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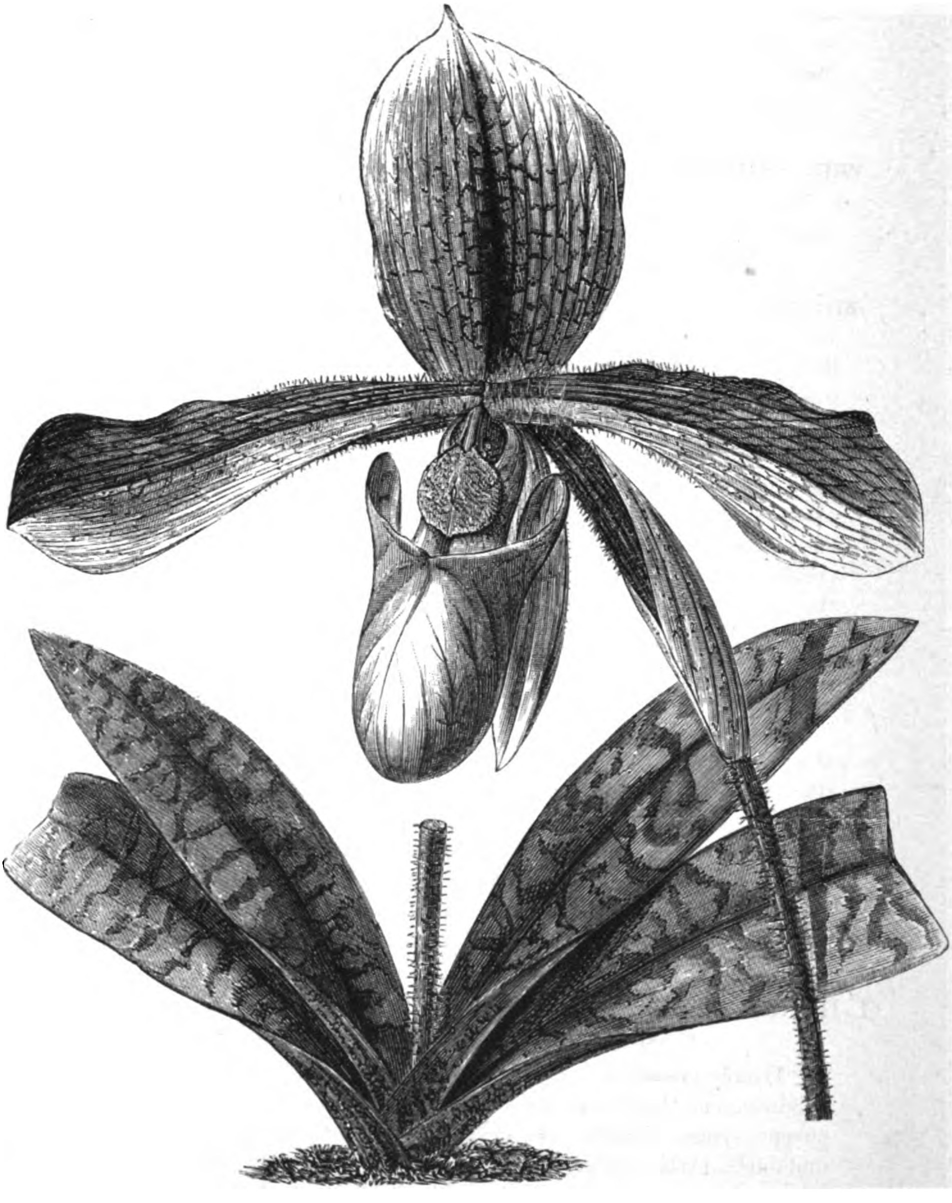
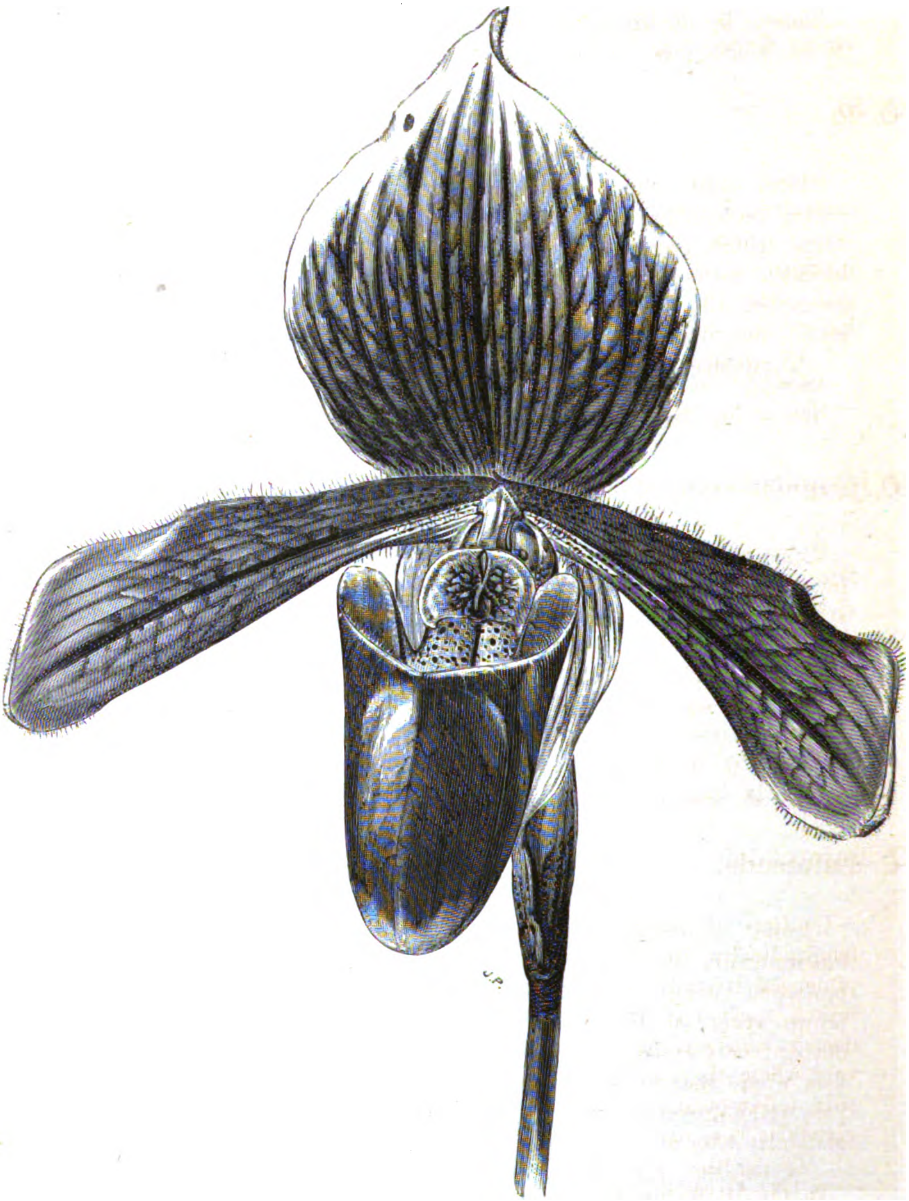
* Not seen by us.



Cypripedium Harrisianum.



Cypripedium Harrisianum superbum.

on each side of it scattered over the whole surface.; lip purplish brown. Staminode with a white border and purple disc."

Cypripedium Hornianum, Rchb. in Gard. Chron. II. s. 3 (1887), p. 428.

Raised by F. Horn, gardener to Baron Nathaniel de Rothschild, at Hohe Warte, near Vienna.

C. Io.

C. Argus × *C. Lawrenceanum.*

Upper sepal white with alternately longer and shorter veins, the central ones green, the others deep purple; lower sepal white with green veins; petals greenish, pale purple at the tips, and with numerous large blackish warts chiefly on the basal half; lip brownish purple, pale green beneath. Staminode pale green with darker green central reticulations and dull rose-pink border.

Cypripedium Io, Rchb. in Gard. Chron. XXV. (1886), p. 488. Sander's *Reichenbachia I.* t. 23.

Raised by Mr. Norman C. Cookson, of Oakwood, Wylam-on-Tyne.

C. javanico-superbiens.

Parentage expressed by the name.

Upper sepal pale green with deeper green veins and whitish margin; lower sepal much smaller, white with light green veins; petals green, spotted with blackish warts to two-thirds of their length, the apical third pale rose-purple with fewer spots; lip brown in front, pale green beneath, the infolded lobes reddish brown. Staminode pale yellow-green with deep green markings.

Cypripedium javanico-superbiens, Rev. hort. 1885, p. 476.

Raised by M. Bleu, Secretaire général de la Societé nationale d'Horticulture de France.

C. Laforcadei.

C. barbatum × *C. insigne Chantinii.*

Central and basal area of upper sepal light yellow-green traversed longitudinally by brown-purple veins, the broad white apical border prolonged laterally to near the base; lower sepal pale green with some brown spots on the central veins; petals light purplish brown with deeper veins except towards the base on the inferior side of the mid-vein where they are yellow-green spotted with purple; lip reddish brown, pale yellow-green beneath. Staminode buff-yellow with the characteristic glandular boss of *C. insigne.*

Cypripedium Laforcadei, Hort. Bauer (1884), *fide* Godefroy's *Orchidophile*, 1886, p. 122. C. Bartetii, Carriere in Rev. Hort. 1886, p. 84.

sub. var.—*Bartet's*, upper sepal with a vinous purple mid-vein, and a large pale purple stain near each lateral margin; lower sepal with a white area at the apex; the petals more distinctly suffused with purple, especially towards the top.

Raised by M. Bauer, principal propagator at the Etablissement de la Muette, Paris. Both forms are from the same seed capsule and approach so closely to *C. Ashburtoniæ* that they might without any impropriety be brought under it as varieties. As in that hybrid, the influence of the pollen parent is very decided.

C. Lathamianum.*

C. Spicerianum × *C. villosum.*

"Upper sepal white with a dark purple mid-line, green at the base with a few lines; lower sepal greenish; petals with a dark mid-line and with brown margins that are undulate near the apex, superior half light ochre-yellow at the base, brownish at the apex, inferior half greenish yellow; lip as in *Cypripedium villosum*, but paler. Staminode also as in *C. villosum.*"

Cypripedium Lathamianum, Rchb. in Gard. Chron. III. s. 3 (1888), p. 360.

Raised by Mr. W. B. Latham, Curator of the Botanic Garden, Birmingham.

C. Leeanum.

C. insigne × *C. Spicerianum.*

Upper sepal white with an apple-green blotch at the base, the central area traversed by longitudinal lines of spots that are mauve-purple in the white area and brown in the green blotch; lower sepal pale apple-green; petals greenish yellow with brown-purple veins; lip yellowish brown with deeper veins, the infolded lobes and inner surface opposite the aperture buff-yellow, the latter spotted with purple. Staminode dull buff-yellow with an orange-yellow glandular boss.

Cypripedium Leeanum, Veitch and Gard. Chron. XXI. (1884), p. 50.

var.—superbum.

C. insigne Maulei × *C. Spicerianum.*

Differs from *Cypripedium Leeanum* chiefly in the upper sepal being broader, with a larger area of pure white and the spots within it of a brighter purple; the lower sepal is also spotted at the base.

C. Leeanum superbum, Veitch. Gard. Chron. XXIII. (1885), p. 277. Godefroy's *Orchidophile*, 1885, p. 240. Rchb. in Gard. Chron. XXV. (1886), p. 168. Williams' *Orch. Alb. V.* t. 223 (Leeanum).

The second of the two forms was raised first by Seden at our nursery. The hybrid now known as *Cypripedium Leeanum* was raised in the collection of Sir Trevor Lawrence, Bart, at Burford Lodge, Dorking, and flowered for the first time some time after the first flowering of

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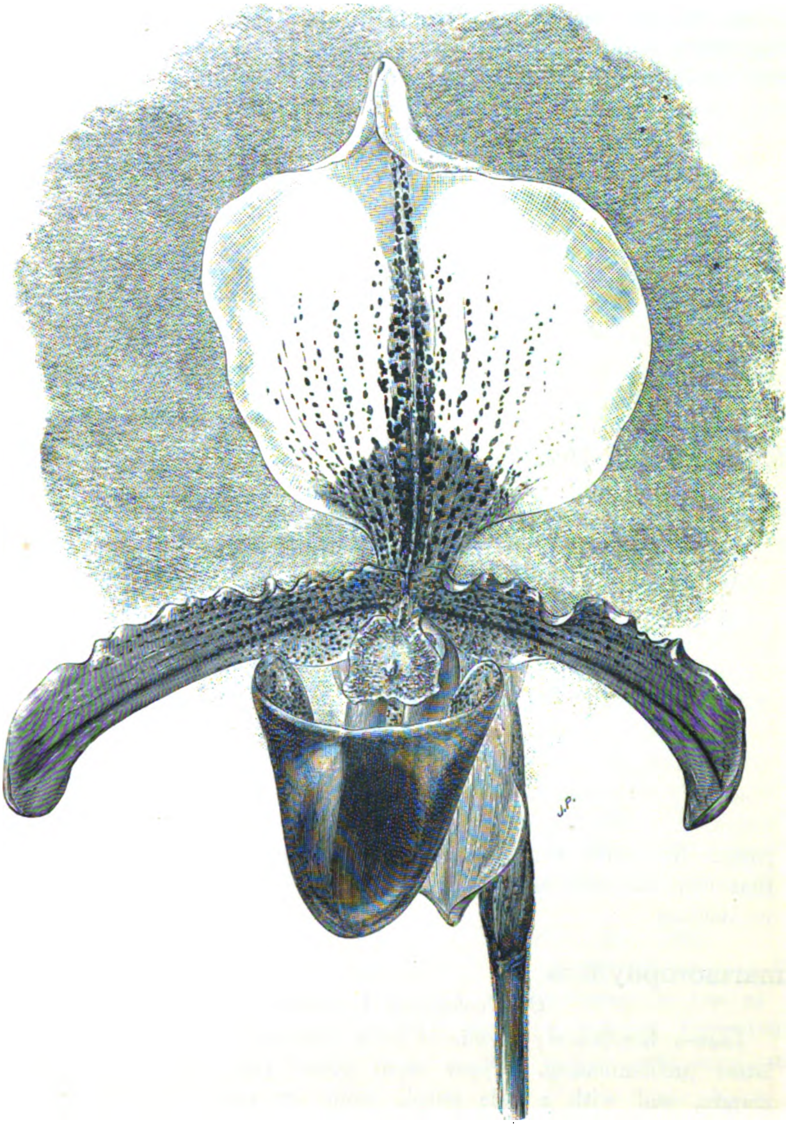
* Not seen by us.

Seden's acquisition, which being as great an improvement on the Burford Lodge hybrid as the variety *Maulei* is on the typical *C. insigne*, received the name of *superbum*. In both forms the influence of the pollen parent is very decided.



Cypripedium Leeanum superbum.

C. macropterum.

C. Lowii × *C. superbiens.*

Leaves about 9 inches long and 2 inches broad, uniformly tesselated with dark and bright grass-green. Upper sepal light green passing into white at the margin, veins brown at the base passing into green upwards; lower sepal pale green; petals 3—4 inches long, depressed and undulate, the narrower basal half pale yellow freely spotted with blackish purple, the dilated apical half light violet-purple; lip pale yellowish brown. Staminode green in the centre passing into livid purple at the margin.

Cypripedium macropterum, Rchb. in Gard. Chron. XVIII (1882), p. 522. Id. XX. (1883), p. 294.

Raised by Seden at our nursery. It is one of the comparatively few hybrid Cypripedes in which the characteristics of the seed parent predominate in the flower, and those of the pollen parent in the foliage; the influence of *Cypripedium superbiens* is seen only in the spotting on the basal half of the petals and in the large helmet-shaped lip and in the staminode.

C. Madame Van Houtte.

Parentage doubtful; probably *Cypripedium niveum* and one of the species of the *C. venustum* group (*C. barbatum*, &c.).

Upper sepal folded at the mid-vein, pale vinous purple with a broad white margin and yellow-green veins; lower sepal milk-white with bright green veins; petals light vinous purple, paler on each side of the deep purple mid-veins, the other veins yellowish green; lip dull rose-purple, the infolded lobes ivory-white. Staminode ivory-white tinted with rose and with a yellow stain in the centre.

Cypripedium Madame Van Houtte, supra.*

Supposed to have originated in the horticultural establishment of M. Louis Van Houtte at Ghent; but although so little is known of its origin, it is far too distinct and handsome to be omitted from these pages. The only plant raised has been acquired by M. Hye Leysen, of that city, the possessor of one of the choicest collections of Cypripedes in Belgium.

C. marmorophyllum.

C. Hookeræ × *C. barbatum.*

Leaves handsomely tesselated with dark and light greyish green, the latter predominating. Upper sepal green passing into white at the margin, and with a pale purple stain on each side of the mid-vein which is dark purple, the other veins dark green; lower sepal pale green; petals with a dark purple mid-vein, vinous purple except on the inferior side from the base to beyond the middle, which is light green with deeper veins; lip brownish purple, dull green beneath. Staminode dull purple, paler at the margins, whitish in the centre.

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* We are not aware of the name having been previously published. Our Belgian informant who brought the flower from which the above description was taken, believed it was the intention of the owner of the plant to give it the name under which it is described above.

Cypripedium marmorophyllum, Rchb. in Gard. Chron. V. (1876), p. 130.

Raised by Seden at our nursery. The influence of the pollen parent preponderates in the flower, while that of the seed parent is most decided in the foliage.

C. Marshallianum.

C. venustum pardinum × *C. concolor.*

Leaves 5—6 inches long and 1½—2½ inches broad, mottled with blackish green on a light green ground. Upper sepal white tinted with pale rose-purple and densely spotted with purple, the spots chiefly aggregated along the veins; lower sepal wholly concealed by the lip, cream-white spotted with purple; petals coloured like the upper sepal with the rose-purple more diffuse and of a deeper shade, the spots somewhat longer; lip pale yellow-green, much spotted with purple around the aperture. Staminode pale yellow with a light purple stain in the centre.

Cypripedium Marshallianum, Rchb. in Gard. Chron. IV. (1875), p. 804.

Raised by Seden at our nursery. The influence of the pollen parent is very marked in the form of the floral segments.

C. Measuresianum.

C. villosum × *C. venustum*, or *vice versâ.*

Leaves bright green above, much spotted with dull purple beneath. Upper sepal bright yellow-green with a narrow white margin, the central veins blackish brown, confluent at the base, and forming a large blackish brown blotch there; lower sepal pale green, with bright green veins; median vein of petals brown-purple, the superior half orange-brown with brown veins, inferior half paler with green; lip yellowish, with red-brown veins and green reticulations. Staminode orange-brown with a greenish stain in the centre.

Cypripedium Measuresianum, Williams' *Orch. Alb. VII.* t. 304 (1888).

Origin not recorded. It is dedicated to Mr. R. H. Measures, of The Woodlands, Streatham, whose collection of Cypripedes is one of the most complete known. To this form must be referred *Cypripedium Amesianum* (Williams' *Orch. Alb. VIII.* t. 340), said to have been raised from the same cross.

C. Meirax.

Parentage doubtful; supposed to be of the same origin as *Cypripedium chloroneurum.*

Upper sepal white with the central veins green and the outside ones vinous purple; lower sepal white with green veins; petals brown-purple, green at the base; lip brown-purple around the aperture, green beneath. Staminode green and pale purple.

Cypripedium Meirax, Rchb. in Gard. Chron. XIV. (1880), p. 524. Williams' *Orch. Alb. II.* t. 95.

Raised by Mr. Robert Warner, of Broomfield, Chelmsford.

C. melanophthalmum.

Parentage doubtful; supposed to be of the same origin as the preceding.

Upper sepal whitish stained with purple at the base, veins green; lower sepal whitish with green veins; petals with a deep purple mid-vein, the superior half dull purple with some blackish warts along the margin, inferior half pale green stained with pale purple towards the apex; lip reddish purple tinged with green, pale green beneath. Staminode green and pale purple.

Cypripedium melanophthalmum, Rchb. in Gard. Chron. XIV. (1880), p. 525. Williams' *Orch. Alb. III.*, t. 109.

Raised by Mr. Robert Warner.

C. microchilum.

C. niveum × *C. Drurii.*

Plant dwarf and compact. Leaves narrow, 3—5 inches long, handsomely tesselated. Upper sepal white with a deep purple median stripe and with some purple spots in the centre and towards the base, chiefly along the pale green veins; lower sepal greenish white; petals white with a deep purple median stripe and some purple spots on the basal half; lip small and compressed, white with pale yellow-green veins. Staminode with a large yellow central blotch.

Cypripedium microchilum, Rchb. in Gard. Chron. XVII. (1882), p. 77.

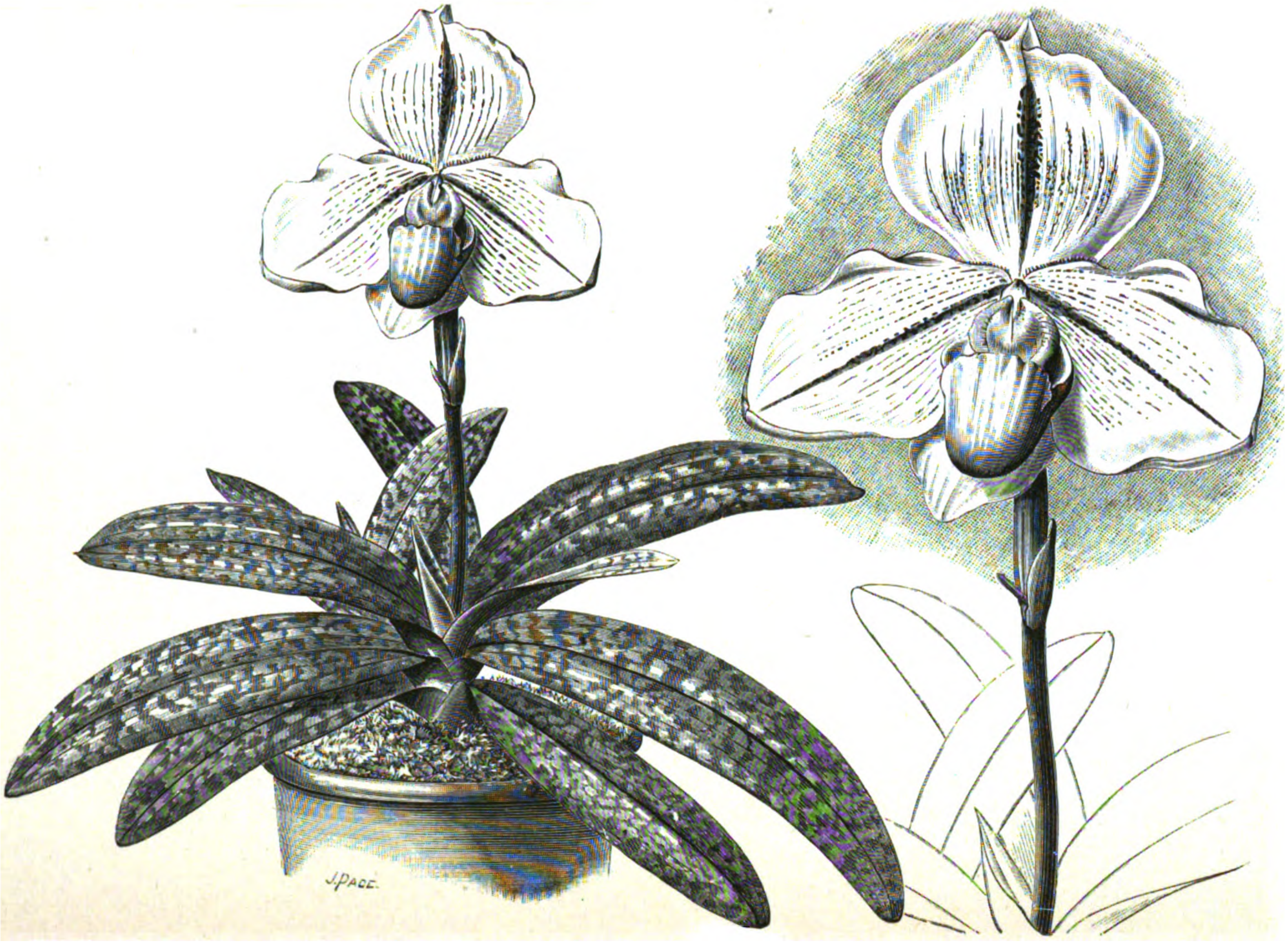
Raised by Seden at our nursery. A very distinct hybrid well-nigh intermediate between the two parents.

C. Morganiæ.

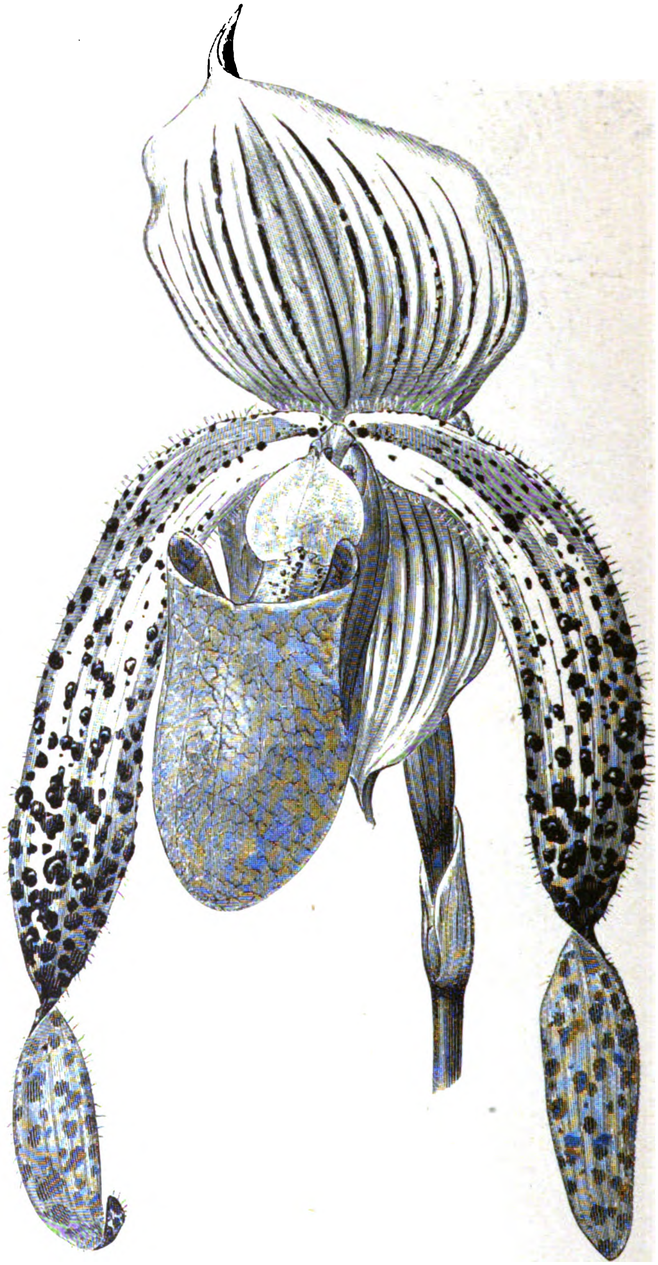
C. superbiens × *C. Stonei.*

Plant more robust than either parent. Leaves broadly strap-shaped, 7—12 inches long, faintly tesselated. Upper sepal white, sometimes with a flush of pale rose towards the lateral margins, with 7—10 deep purple veins alternated with light yellow-green thinner veins; lower sepal similar but smaller, and with fewer purple veins; petals 5—6 inches long, pale yellow spotted with blackish purple warts that are larger and more aggregated towards the tips; lip pale rose-purple with deeper veins and reticulations, the infolded lobes yellowish white with a few purple spots along the margin. Staminode yellowish white.

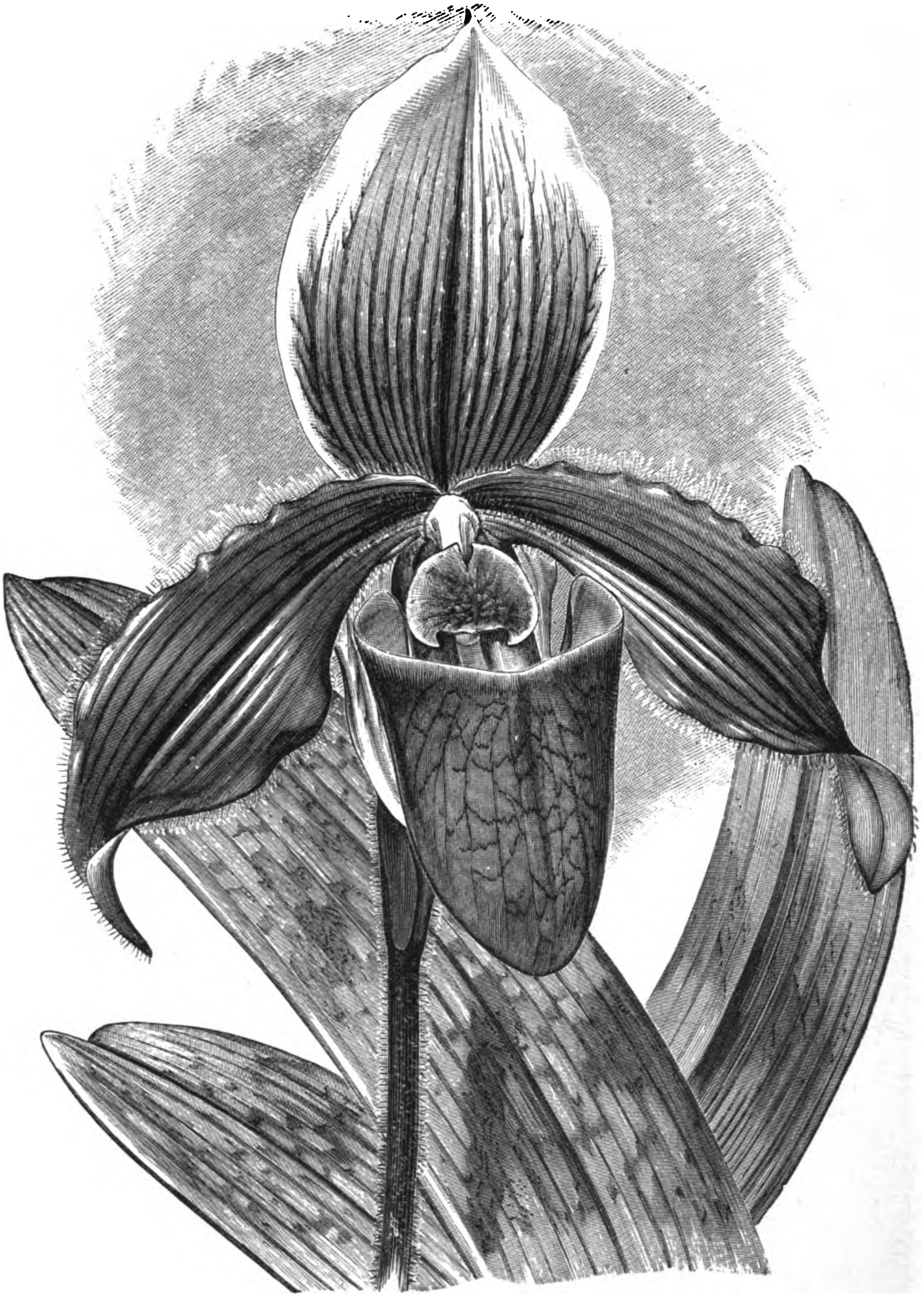
Cypripedium Morganiæ (*lapsu calami* Morganianum), Rchb. in Gard. Chron. XIV. (1880), p. 134. Williams' *Orch. Alb. VII.* t. 313. Gard. Chron. XXVI. (1886), p. 241, icon. xyl.



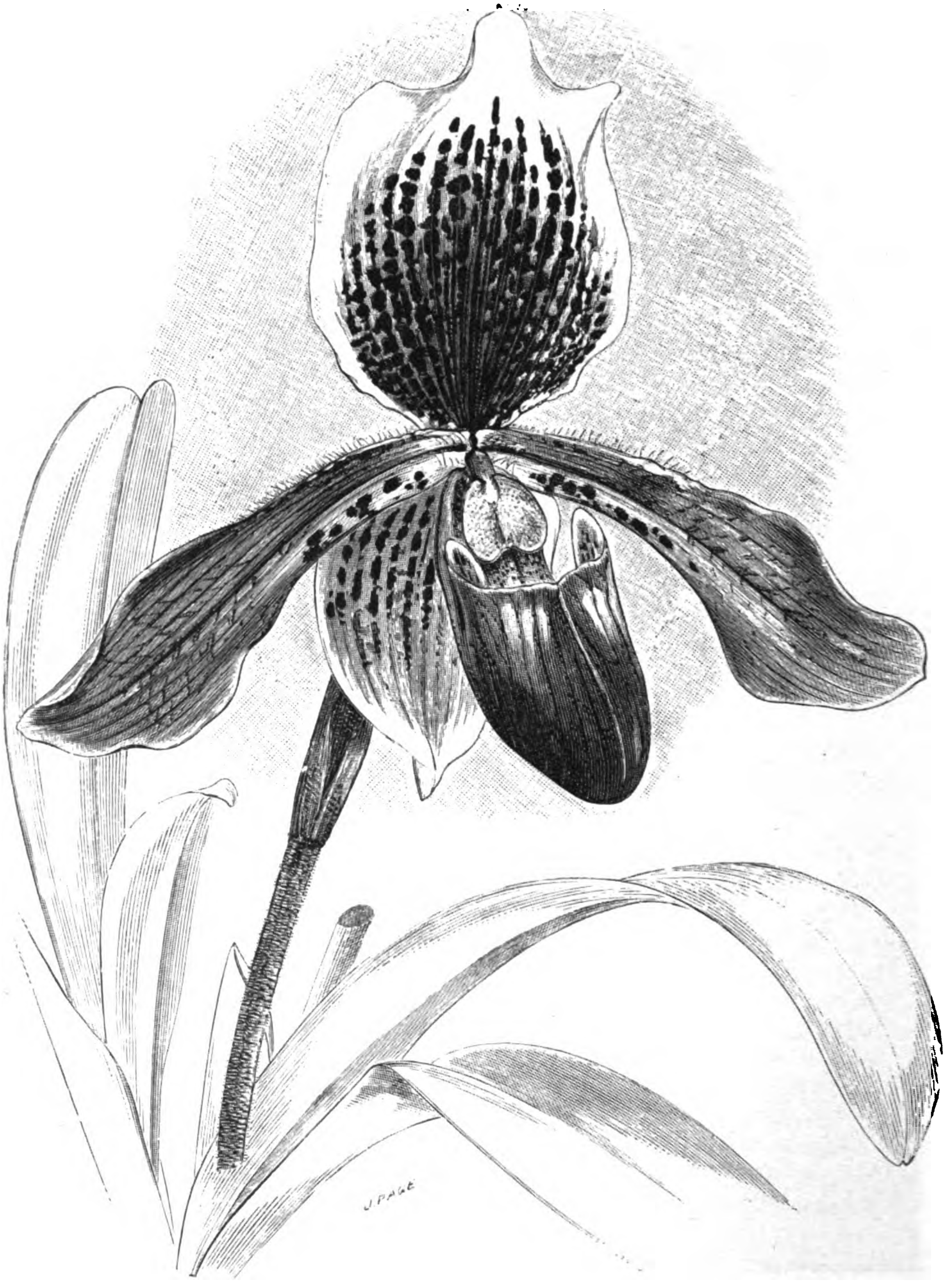
Cypripedium microchilum.



Cypripedium Morganiæ.



Cypripedium Mrs. Canham.



Cypripedium œnanthum superbum.

Raised by Seden at our nursery. Without doubt the *facile princeps* of the group in which we have placed it, to which it stands in pretty much the same relation as *Cypripedium Stonei platytænium* does to the normal *C. Stonei*, the pollen parent, from which its most striking characteristics have been derived. It was dedicated to the late Mrs. Morgan, of New York, an ardent amateur of orchids.

C. Mrs. Canham.

C. superbiens × *C. villosum.*

Leaves 6—9 inches long, faintly tesselated. Flowers among the largest in the group of *Cypripedium villosum* hybrids; upper sepal brownish purple at the base passing into pale green upwards, and with a broad white margin, veins deep brown-purple at the base passing into green upwards; lower sepal white with green veins; petals deflexed, ciliate and undulate at the margins, mid-vein blackish purple, the superior half brownish rose-purple with green veins, inferior half paler; lip yellowish brown with brown venation. Staminode nearly as in *C. superbiens.*

Cypripedium Mrs. Canham, Rolfe in Gard. Chron. II. s. 3 (1887), p. 746.

Acquired by us from the same source as *Cypripedium Charles Canham*, and obtained from the inverted cross. The two differ chiefly through the influence of the pollen parent preponderating in each, so that while in the first-named hybrid some of the more salient characteristics of *C. superbiens* are conspicuous, in the present subject the general aspect of *C. villosum* predominates.

C. nitens.

C. villosum × *C. insigne Maulei.*

Upper sepal apple-green with a broad white margin, and traversed by longitudinal lines of spots that are large and blackish on the green area, and small and purple within the white margin; lower sepal pale green with but few spots; petals ochreous yellow with reddish brown venation; lip yellow-green shaded with brown. Staminode pale buff-yellow with a bright yellow tubercle near the centre.

Cypripedium nitens, Rchb. in Gard. Chron. IX. (1878), p. 398.

Raised by Seden at our nursery. The characteristics of the pollen parent preponderate considerably, but the flower has the highly lustrous surface of *Cypripedium villosum*, which suggested the name *nitens*, "shining."

C. œnanthum.

C. Harrisianum × *C. insigne Maulei.*

Upper sepal white with green veins, along which are numerous purple spots that are sometimes confluent, the broad apical border pure white;

lower sepal white with light green veins, the central ones with a few small purple spots; petals deflexed, vinous purple with green veins, paler at the apex, the mid-vein deep purple; lip dark vinous purple.

Cypripedium œnanthum, Rchb. in Gard. Chron. V. (1876), p. 297.

var.—superbum.

Flowers larger, brighter and more varied in colour; upper sepal deep claret-red with broad lines of blackish purple spots along the veins, which, where they enter the broad white margin, are mauve-purple; petals shaded with yellow-brown.

C. œnanthum superbum, Veitch, Catal. 1885, p. 11. Sander's *Reichenbachia*, *I.* t. 38.

Both forms raised by Seden at our nursery. *Cypripedium œnanthum* was the first hybrid Cypripede to flower of which one of the parents is itself a hybrid; the results obtained by crossing a hybrid with a pure species, or *vice versâ*, show a variability in colour and in a less degree in form, rarely observable in hybrids raised from pure species, which are, as a rule, remarkably constant. The variety *superbum* is one of the handsomest of Cypripedes; we know of no other that presents such a remarkable combination of colours in its flowers.

C. Orestes.

C. Harrisianum × C. sp., probably *C. insigne Maulei.*

Upper sepal pale apple-green, with a broad white border and large red-brown spots along the veins; lower sepal pale green; petals brownish purple with a darker mid-vein, pale yellow green at the base; lip bright vinous purple shaded with brown. Staminode yellowish.

Cypripedium Orestes, supra.

Raised by Seden at our nursery. It is probably an escape from the pot in which the seeds that produced *Cypripedium œnanthum* were sown, which would make it strictly but a variety of that hybrid, from which it is clearly distinct in the colour of its flowers.

C. orphanum.

C. barbatum or allied sp. × *C. Drurii.*

Upper sepal white tinted with pale purple towards the margin, with a broad deep purple median band, and with 3—4 green veins on each side of it; lower sepal whitish with green veins; petals white with a deep purple median line and two green veins on each side of it, margins pale purple; lip brownish purple mottled with vinous purple. Staminode brownish purple.

Cypripedium orphanum, Rchb. in Gard. Chron. XXVI. (1886), p. 166.

Raised by Seden at our nursery. It is one of the most distinct of the group in which we have placed it.

C. pavoninum.*

C. villosum Boxalli × *C. venustum.*

"Upper sepal pale green bordered with white and with some sepia brown blotches at the base, veins sepia-brown; lower sepal whitish with a few brown spots in two rows; petals with a brown median vein, the superior part brown tinted with purple, the central area pale yellow-brown spotted with brown, the inferior part similar but paler and with fewer spots; lip nearly that of *Cypripedium venustum*, pale yellowish brown beneath. Staminode brownish yellow with green nervation."

Cypripedium pavoninum, Rchb. in Gard. Chron. III. s. 3 (1888), p. 264.

Raised by Mr. D. O. Drewett, of Riding, Mill-on-Tyne.

C. Peetersianum.*

C. philippinense × *C. barbatum.*

"Upper sepal white with brown-purple (dahlia-carmine?) veins; lower sepal similar but smaller; petals whitish with rows of purple spots at the base, the remainder brown-purple (dahlia-carmine); lip reddish brown above, yellowish green (ochre?) beneath."

Cypripedium Peetersianum, Rchb. in Gard. Chron. III. s. 3 (1888), p. 331.

Origin not recorded. Named in compliment to M. Peeters, of St. Gilles, Brussels.

C. pleistochlorum.

C. barbatum × *C. javanicum virens.*

Upper sepal whitish with a faint flush of pale purple near each lateral margin, central veins green, the outside ones purple; lower sepal white with green veins; basal half of petals dull green, distal half brown-purple with green veins; lip deep brown-purple. Staminode pale green with dark green venation.

Cypripedium pleistochlorum, Rchb. in Gard. Chron. II. s. 3 (1887), p. 552.

Raised by Mr. D. O. Drewett, of Riding, Mill-on-Tyne.

C. plunerum.

Parentage doubtful; supposed to be *C. villosum* × *C. venustum.*

Upper sepal whitish with deep green veins; lower sepal white with fewer veins; petals green at the base, mid-vein blackish, the superior half purplish brown with green veins and 6—7 blackish warts at the margin, the inferior half paler; lip dull yellowish purple. Staminode green.

Cypripedium plunerum, Rchb. in Gard. Chron. I. s. 3 (1887), p. 40.

Raised by Mr. Norman C. Cookson, of Oakfield, Wylam-on-Tyne.

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* Not seen by us.

C. politum.

Parentage doubtful; supposed to be of the same origin as *Cypripedium chloroneurum*, etc.

Leaves 5—7 inches long, with curious blackish green hieroglyphic markings above, spotted and stained with dull purple beneath. Upper sepal white with the basal area spotted with dark purple, the mid-vein blackish purple, the alternately longer and shorter veins on each side of it dark green; lower sepal white with green veins; basal half of petals pale green spotted with blackish warts, apical half dull purple; lip purplish brown with darker venation, the infolded lobes pale green spotted with purple. Staminode greenish with a pale rose-colour stain.

Cypripedium politum, Rchb. in Gard. Chron. XIV. (1880), p. 525. Williams' *Orch. Alb. I.* t. 36.

Raised by Mr. Robert Warner, of Broomfield, Chelmsford.

C. polystigmaticum.*

C. venustum ? × C. Spicerianum.

"Upper sepal as in *Cypripedium Spicerianum*, nerves broad with ramifications of purple; lower sepal white with a lightish ochre base, and with lines of brownish purple spots; petals green at the base with numerous small blackish spots, light reddish brown from the middle to the apex, centre vein brownish purple; lip light brownish purple with an ochre shade on the inferior median area. Staminode light purple, with some green in the centre."

Cypripedium polystigmaticum, Rchb. in Gard. Chron. IV. s. 3 (1888), p. 407.

Raised by Mr. R. H. Measures, of the Woodlands, Streatham.

C. Porphyrochlamis.

C. barbatum Crossii × C. hirsutissimum.

Leaves faintly tesselated. Flowers large; upper sepal deep purplish crimson with blackish veins and white margin; lower sepal much paler; petals yellowish green at the base, dotted with minute blackish warts, glossy violet-purple at the apex; lip brownish purple in front, greenish beneath. Staminode brownish purple.

Cypripedium Porphyrochlamis, Rchb. in Gard. Chron. XXI. (1884), p. 476.

Raised by Seden at our nursery.

C. pycnopterum.

C. venustum × C. Lowii.

Upper sepal light green, lower sepal paler; petals green at the base where there are some brown warty blotches, the dilated apical portion pale purple; lip brownish olive-green. Staminode brownish green with deeper green reticulations in the centre.

Cypripedium pycnopterum, Rchb. in Gard. Chron. V. (1876), p. 622.

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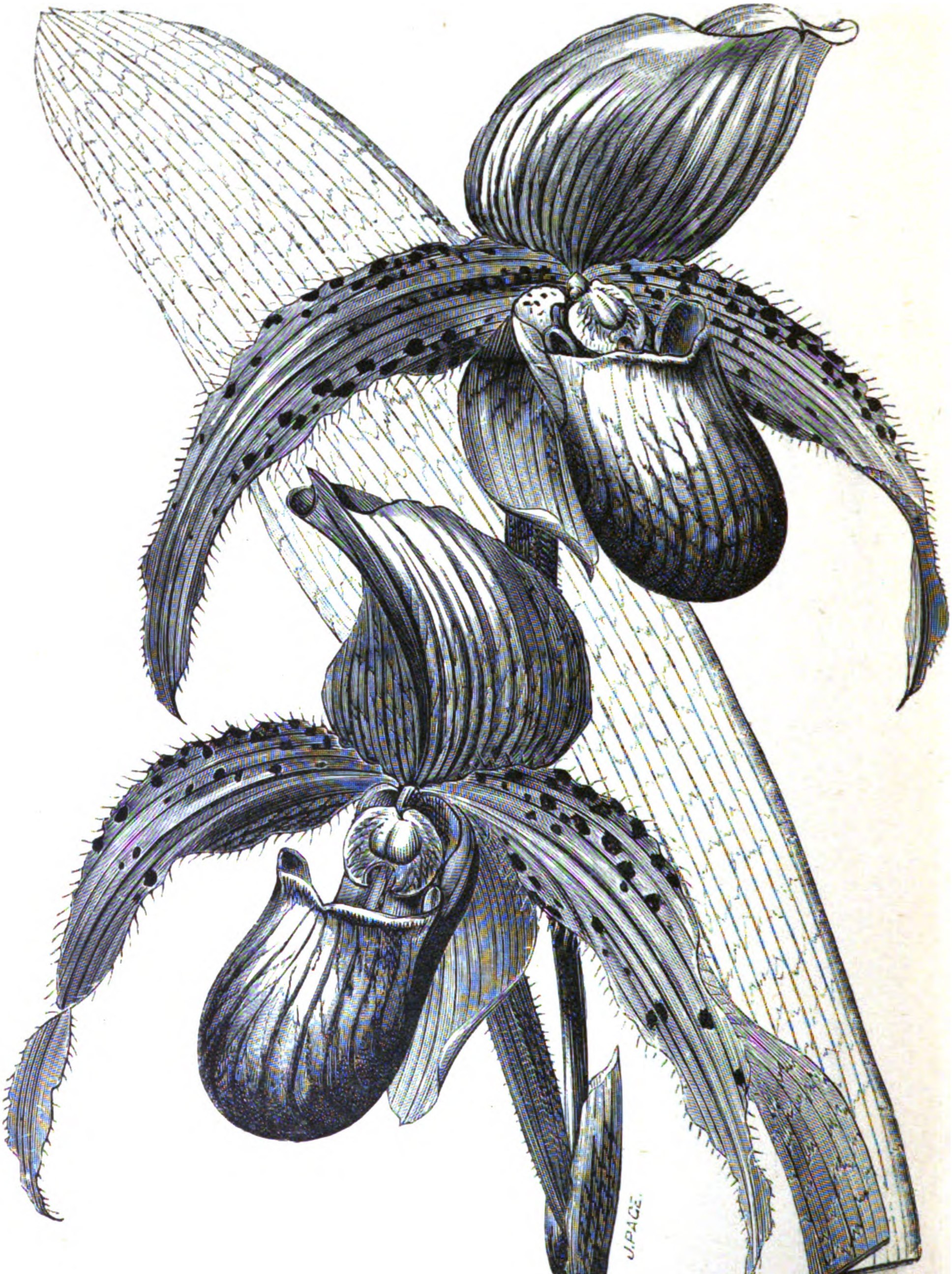
* Not seen by us.



Cypripedium selligerum.

var.—porphyrospilum.

Flowers larger; sepals whitish with green veins: petals more brightly coloured; infolded lobes of lip yellowish with a few brownish warts.

C. pycnopterum porphyrospilum, supra.* C. porphyrospilum, Rchb. in Gard. Chron. XII. (1879), p. 489.

Raised by Seden at our nursery. As both forms were raised from seeds of the same capsule, the second can only be regarded as a variety of the first which it surpasses in size of flower and depth of colour. In both forms the influence of the pollen parent greatly preponderates.

C. radiosum.

C. Lawrenceanum × *C. Spicerianum.*

Leaves tesselated. Upper sepal nearly as in *Cypripedium Spicerianum*, white with a green blotch at the base, with purple veins and a deep purple stripe at the fold; lower sepal pale green; petals slightly deflexed, slightly undulate and ciliate at the margin, green with brown veins; lip greenish brown, paler beneath. Staminode purplish, paler at the margin.

Cypripedium radiosum, Rchb. in Gard. Chron. XXIV. (1885), p. 424.

Raised by Seden at our nursery.

C. Sallierii.

C. villosum × *C. insigne.*

Upper sepal apple-green with a white border prolonged almost to the base, veins deeper green along which are numerous blackish brown spots; lower sepal pale green with few, or without spots; petals with a brown-purple mid-vein, the superior half brownish purple, the inferior half yellow-green; lip yellowish brown, the infolded lobes buff-yellow, as is the staminode, which has the characteristic tooth of both parents.

Cypripedium Sallierii, Godefroy *fide* E. Bergman in Rev. Hort. 1885, p. 476. Godefroy's Orchidophile, 1887, p. 33.

A hybrid that appeared in the collection of Madame Fould at the Château du Val, near St. Germain, in France, but by whom raised is unknown. A hybrid from the same cross and identical with it, has been since raised by Mr. J. C. Bowring, of the Forest Farm, near Windsor. It is named in compliment to M. Sallier, Madame Fould's gardener.

C. selligerum.

C. barbatum × *C. philippinense.*

Upper sepal white with a green stain at the base and with alternately longer and shorter deep purple veins; lower sepal white with paler purple veins; petals 3—4 inches long, greenish at the base with some blackish warts chiefly along the superior margin, the remainder rose-purple, paler at the tips; lip brownish purple with darker venation. Staminode green, studded with short purple hairs.

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* See page 72, foot note.

Cypripedium selligerum, Rchb. in lit. Veitch Catalogue, 1878, p. 13, icon. xyl. Gard. Chron. XIII. (1880), p. 776. Williams' *Orch. Alb. VI.* t. 255.

var.—majus.

Plant more robust. Flowers larger in all their parts, and more brightly and richly coloured.

C. selligerum majus, Veitch.

Raised by Seden at our nursery. The variety *majus* is one of the most stately Cypripedes in cultivation.

C. superciliare.

C barbatum × *C. superbiens.*

Upper sepal white stained with vinous purple, and having alternately longer and shorter dark green veins; lower sepal white with paler green veins; petals pale rose-purple along the middle and at the tips, the remaining area pale green studded with blackish warts; lip brownish purple. Staminode pale green mottled with dark green.

Cypripedium superciliare, Rchb. in Gard. Chron. V. (1876), p. 795.

Raised by Seden at our nursery. The flowers of this and the following hybrid are among the largest in the group in which we have placed them.

C. Swanianum.

C. Dayanum × *C. barbatum.*

Upper sepal white with alternately longer and shorter veins, the middle ones green, the outside ones vinous purple; lower sepal white with green veins; petals sometimes without warts, sometimes with a few small ones along the superior margin, basal portion green or brownish green, apical portion pale purple; lip brownish purple, the infolded lobes paler and densely spotted with purplish warts. Staminode green.

Cypripedium Swanianum, Rchb. in Gard. Chron. VI. (1876), p. 36.

Raised by William Swan, then gardener to the late Mr. W. Leech, of Oakley, Fallowfield, Manchester.

C. Tautzianum.

C. niveum × *C. barbatum.*

Leaves handsomely tesselated. Flowers among the largest in the group in which we have placed it and distinguished by the predominance of a rich vinous purple in all the segments, with some white interspaces and white margins; central area of upper sepal tinted with pale green, the mid-vein dark purple with 2—3 green veins on each side of it, the outside veins dark purple; petals fringed with blackish hairs and with the veins of a deeper purple than the ground colour; lip dark purple, the infolded lobes warty.

Cypripedium Tautzianum, Rchb. in Gard. Chron. XXVI. (1886), p. 681.

Raised by Seden at our nursery. This fine hybrid is appropriately dedicated to Mr. F. G. Tautz, of Studley House, Hammersmith, the possessor of one of the most complete collections of Cypripedes yet brought together.

C. tesselatum porphyreum.

C. concolor × *C. barbatum.*

Scapes 2—3 flowered. All the floral segments of a pale buff-yellow much stained with rose-purple, the purple greatly preponderating; veins of upper sepal deep vinous purple, those of the lower sepal paler, the veins of the petals with numerous blackish purple spots towards the base; lip deeper in colour in front than the other segments, pale green beneath, the infolded lobes spotted with purple. Staminode pale greenish yellow.

Cypripedium tesselatum porphyreum, Rchb. in Gard. Chron. XV. (1881), p. 41. Id. XX. (1883), p. 492.

Raised by Seden at our nursery. The coloration of this beautiful hybrid is unique; the rose-purple is of a peculiarly distinct shade not seen in any other Cypripede known to us.

C. Thibautianum.

C. Harrisianum × *C. insigne Maulei.*

Upper sepal apple-green with a broad pure white margin and with blackish brown spots along the veins, those on the central veins more or less confluent; lower sepal light green with a few blackish spots towards the base; petals red-brown passing to tawny yellow at the margins; lip red-brown, paler beneath. Staminode buff-yellow.

Cypripedium Thibautianum, Rchb. in Gard. Chron. XXV. (1886), p. 104.

Raised by Seden from the same cross as *Cypripedium œnanthum*, and therefore but a variety of that hybrid, but quite distinct from it in colour. It is dedicated to M. Thibaut, the well-known nurseryman at Sceaux, near Paris.

C. vernixium.

C. Argus × *C. villosum.*

Leaves tesselated. Flowers large with a glossy varnished surface; upper sepal green with narrow white margin, the veins blackish and the central and basilar area spotted with blackish purple; lower sepal pale green with darker green veins; petals deflexed, yellowish brown toned with purple and spotted with blackish warts towards the base; lip brownish green. Staminode yellowish green, with green reticulations.

Cypripedium vernixium, Rchb. in Gard. Chron. XI. (1879), p. 398.

Raised by Seden at our nursery.

C. vexillarium.

C. barbatum × *C. Fairieanum.*

Plant of dwarf habit with tesselated leaves. Upper sepal vinous purple with dark purple veins, except at the base, where they are grass-green with the interspaces white; lower sepal white with a faint flush of vinous purple, the veins green; petals deflexed and recurved as in *Cypripedium Fairieanum*, undulate and ciliate at the margins, the superior half green with purple margin, the inferior half white with purple margin, veins green; lip brownish red, paler beneath, the infolded lobes pale green spotted with purple warts. Staminode pale brownish green.

Cypripedium vexillarium, Rchb. in Gard. Chron. 1870, p. 1373.

Raised by Dominy at our nursery. The influence of the pollen parent, itself one of the most beautiful of Cypripedes, so strikingly preponderates in this hybrid that it is scarcely less admired than its progenitor.

C. Williamsianum.

Parentage doubtful; probably *C. villosum* × with one of the *C. venustum*, *C. barbatum*, etc., group.

Leaves faintly tesselated. Middle area of upper sepal blackish brown, the mid-vein purple, the other veins green, margin white; lower sepal whitish with green veins; petals with a dark brown mid-vein, the superior half light brownish purple with green veins, the inferior half much paler; lip as in *Cypripedium villosum*, brownish yellow toned with purple, greenish yellow beneath.

Cypripedium Williamsianum, Rchb. in Gard. Chron. XVII. (1882), p. 218.

Raised by Mr. Robert Warner, of Broomfield, Chelmsford, and dedicated to Mr. B. S. Williams, of Holloway.

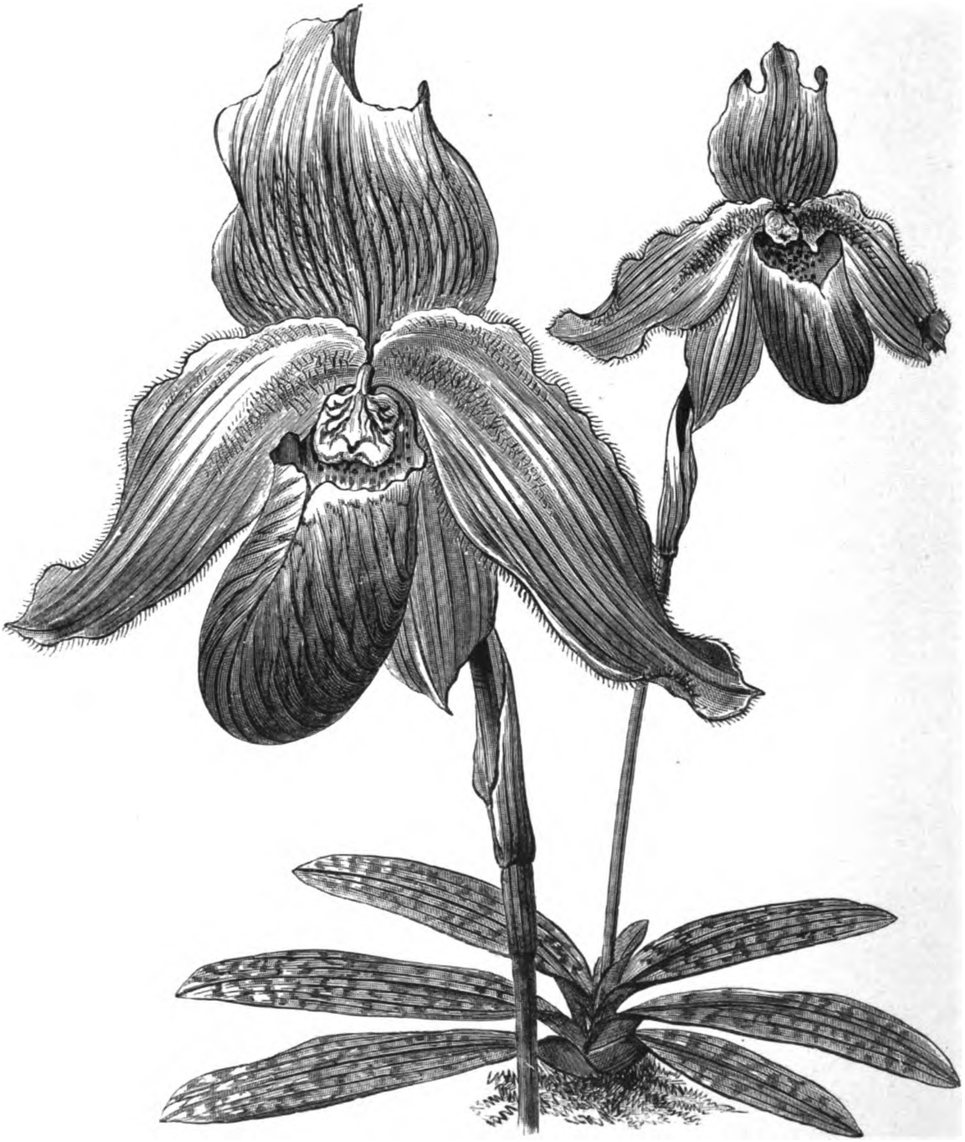
C. Winnianum.

C. villosum × *C. Drurii.*

Upper sepal green margined with white, and with a broad blackish purple mid-line, on each side of which is a brownish stain; lower sepal yellow-green; petals incurved, yellow-brown with a dark purple mid-line; lip yellow-brown, paler beneath. Staminode pale yellow, with the characteristic boss of *Cypripedium villosum*.

Cypripedium Winnianum, Rchb. in Gard. Chron. XXV. (1886), p. 362.

Raised by Seden at our nursery, and dedicated to Mr. Charles Winn, of Selly Hill, Birmingham.



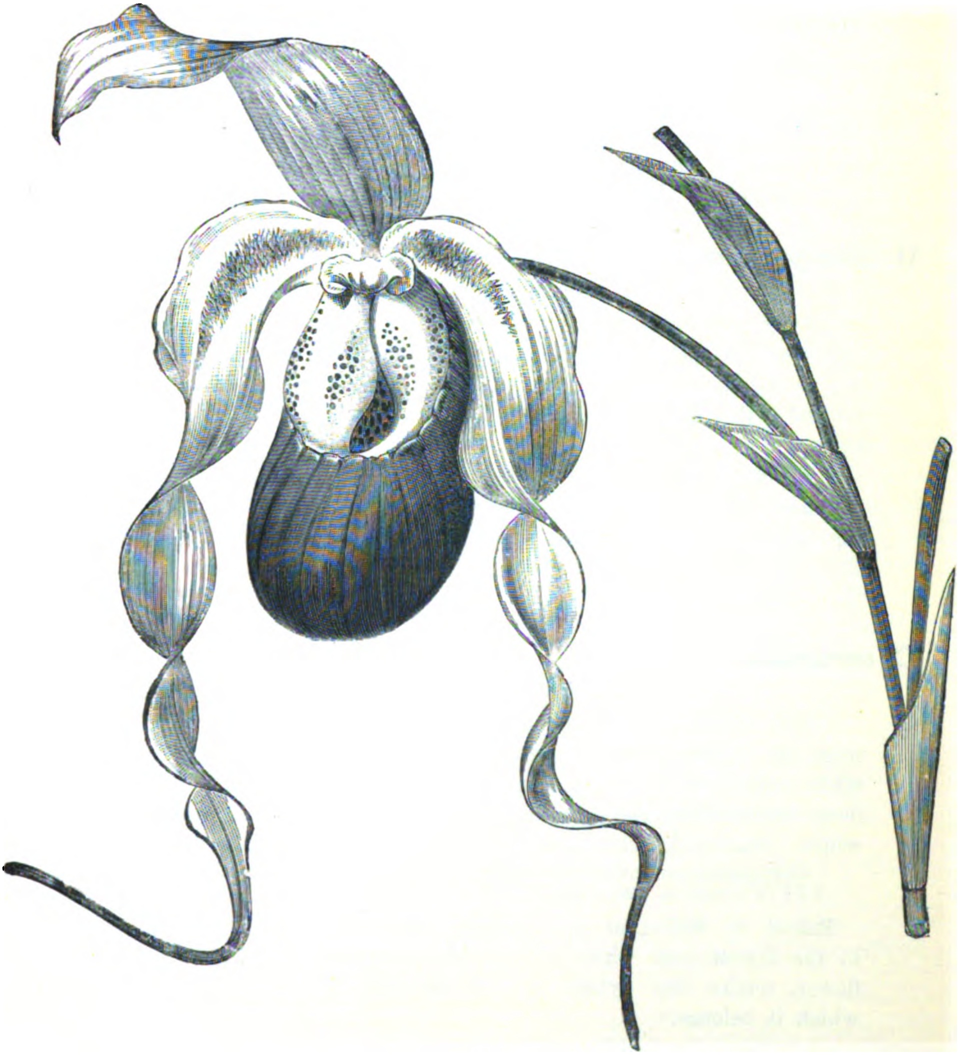
Cypripedium vexillarium.

SELENIPEDIUM HYBRIDS.

Cypripedium Ainsworthii.

C. longifolium Hartwegii (*Roezlii*) × *C. Sedenii.*

Upper and lower sepal ivory-white flushed with pale rose and with pale rose and yellow-green veins; petals with a yellow-green mid-vein, on each side of which is an ivory-white band extending from the base to two-thirds of the length, the margins and apical area rose-pink; lip



Cypripedium albo-purpureum.

deep rose-pink, the infolded lobes ivory-white spotted with rose-purple. Staminode greenish white fringed with purple hairs on the basal side.

Cypripedium Ainsworthii, Rchb. in Gard. Chron. XI. (1879), p. 748.

var.—calurum.

C. longifolium × *C. Sedenii.*

Differs in no essential character from the above The leaves somewhat shorter and the petals a little narrower at the base.

C. Ainsworthii calurum, supra. C. calurum, Rchb. in Gard. Chron. XV. (1881), p. 41. *Fl. and Pomol.* 1884, p. 145, t. 619. Williams' *Orch. Alb. III.* t. 136.

Cypripedium Ainsworthii was raised by Mitchell, gardener to Dr. Ainsworth, Cliff Point, Broughton, Manchester; the variety *calurum* was raised by Seden at our nursery. With these forms may perhaps be bracketed *C. Lemoinierianum*, Gard. Chron. III. s. 3 (1888), p 712.

C. albo-purpureum.

C. Schlimii × *C. Dominii.*

Both sepals ivory-white tinted with pale rose at the margins, veins yellow-green; petals 5 inches long, pendulous, twisted, pale rose-pink; lip rose-carmine with darker venation, the infolded lobes ivory-white spotted with dark rose-pink. Staminode white fringed with purple hairs.

Cypripedium albo-purpureum, Rchb. in Gard. Chron. VIII. (1877), p. 38.

Raised by Seden at our nursery. A very distinct hybrid, in which the influence of the pollen parent greatly predominates in the form of the floral segments, while that of the seed parent is seen chiefly in their colour.

C. cardinale.

C. Sedenii × *C. Schlimii albiflorum.*

Upper sepal ivory-white, sometimes with a faint flush of pale rose near the margins; lower sepal whitish (concealed by the lip); petals white tinted with pale rose at the base and along the margins; lip deep rose-carmine, the infolded lobes banded alternately with rose and white. Staminode white with a rose-purple spot near the front margin.

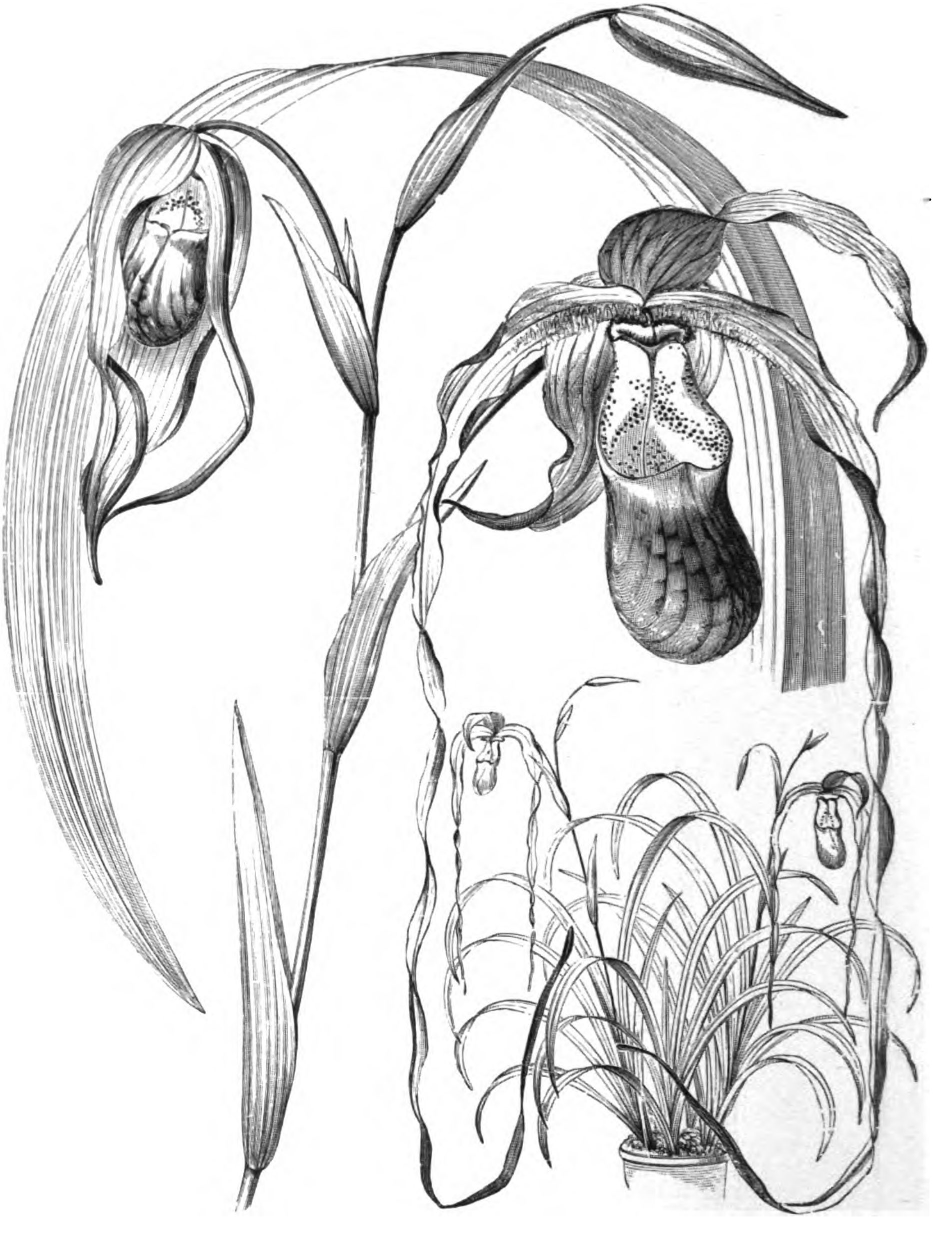
Cypripedium cardinale, Rchb. in Gard. Chron. XVIII. (1882), p. 488. *The Garden, XXVII.* (1885), p. 520, t. 495.

Raised by Seden at our nursery. The richly coloured lip in contrast to the almost pure white sepals and petals, and the elegant form of the flower, render this hybrid one of the most attractive in the group to which it belongs.

C. conchiferum.

C. caricinum × *C. longifolium Hartwegii* (*Roezlii*).

Upper sepals white with yellow-green veins; lower sepal much broader,

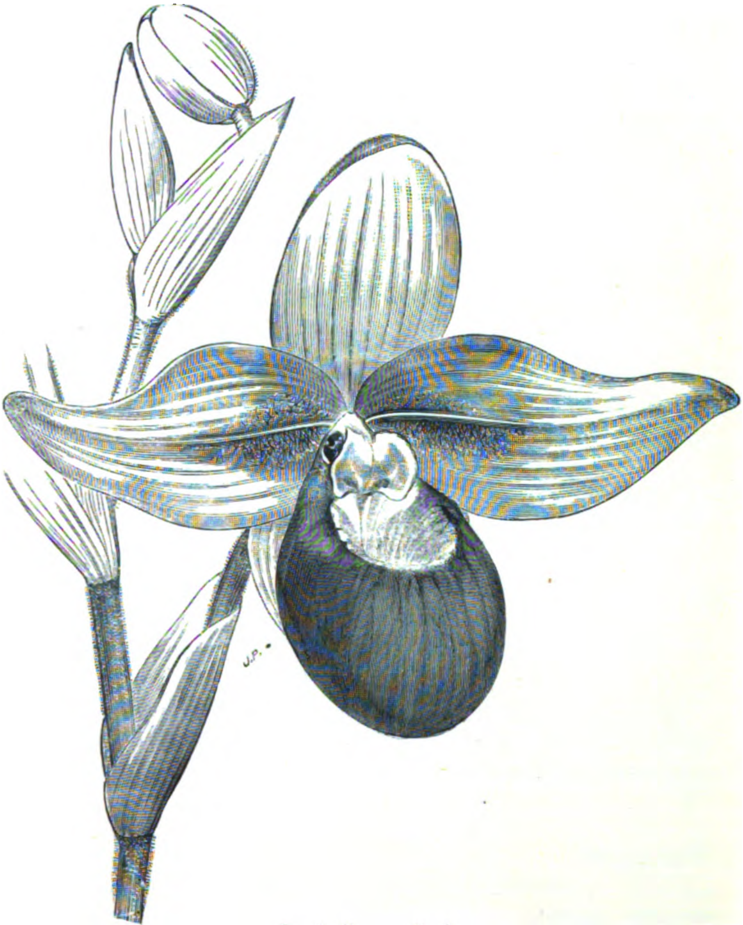


Cypripedium Dominianum.

whitish with pale brownish red veins; petals sub-pendulous, 4—5 inches long, pale rose-pink with white margins, yellowish green at the base and along the median vein to about half the length: lip light yellow-green, the infolded lobes paler and spotted with rose-pink and green. Staminode fringed with blackish hairs at the back.

Cypripedium conchiferum, Rchb. in Gard. Chron. XV. (1881), p. 330.

Raised by Mr. J. C. Bowring, of Forest Farm, near Windsor.



Cypripedium cardinale.

C. Dominianum.

C. caricinum × C. caudatum.

Upper sepal white with pale buff-yellow veins; lower sepal similar with paler veins; petals pendulous, 7—8 or more inches long, pale yellow with green veins at the base, the remainder dull rose-pink; lip yellowish green with brown venation, the infolded lobes pale yellow spotted with deep rose. Staminode greenish, fringed at the back with blackish hairs.

Cypripedium Dominianum, Rchb. in Gard. Chron. 1870, p. 1181. *Floral Mag.* t. 499.

Raised by Dominy at our nursery. This was the first hybrid raised among the SELENIPEDIA, and is still one of the most admired of the group in which we have placed it.

C. grande.

C. longifolium Hartwegii (*Roezlii*) × *C. caudatum.*

Flowers the largest of the Selenipedium hybrids; upper sepal yellowish white with yellow-green veins; lower sepal similar but with paler veins; petals 12—15 or more inches long, rose-pink, except the broader basilar portion which is yellowish with green veins; lip greenish yellow toned with brown, paler beneath, the infolded lobes ivory-white spotted with deep rose. Staminode pale yellow, fringed with blackish hairs at the back.

Cypripedium grande, Rchb. in Gard. Chron. XV. (1881), p. 462. Id. XVIII. (1882), p. 488.

Raised by Seden at our nursery. This is the most robust Cypripedium known; the sword-shaped leaves are 24—30 inches long; the flower scapes frequently exceed a yard in height, and the flowers measure 7—8 inches across the sepals from tip to tip.

C. leucorhodum.

C. longifolium Hartwegii (*Roezlii*) × *C. Schlimii albiflorum.*

Upper sepal white tinted with pale rose on the basal area; lower sepal wholly white; petals spreading, white at the base and on each side of the median vein, pale rose at the margins and apex; lip pale rose-pink suffused with white, the infolded lobes ivory-white. Staminode ivory-white, fringed with purple hairs at the back.

Cypripedium leucorhodum, Rchb. in Gard. Chron. XXIII. (1885), p. 270.

Raised by Seden at our nursery. The influence of the pollen parent preponderates in the foliage, sepals, and lip, also in the colour of the flower.

C. nitidissimum.*

C. caudatum Warscewiczii × *C. conchiferum.*

"Sepals whitish yellow with numerous yellow-brown nerves; tails (petals) long, yellowish in the centre downwards, passing into yellow-brown towards the tip; lip varnished, brown with a central green stripe, pallid beneath, infolded lobes pale yellow with brown spots Staminode brown, fringed with purple hairs behind."

Cypripedium nitidissimum, Rchb. in Gard. Chron. IV. s 3 (1888), p. 6.

Raised by Mr. Norman C. Cookson, of Oakwood, Wylam-on-Tyne.

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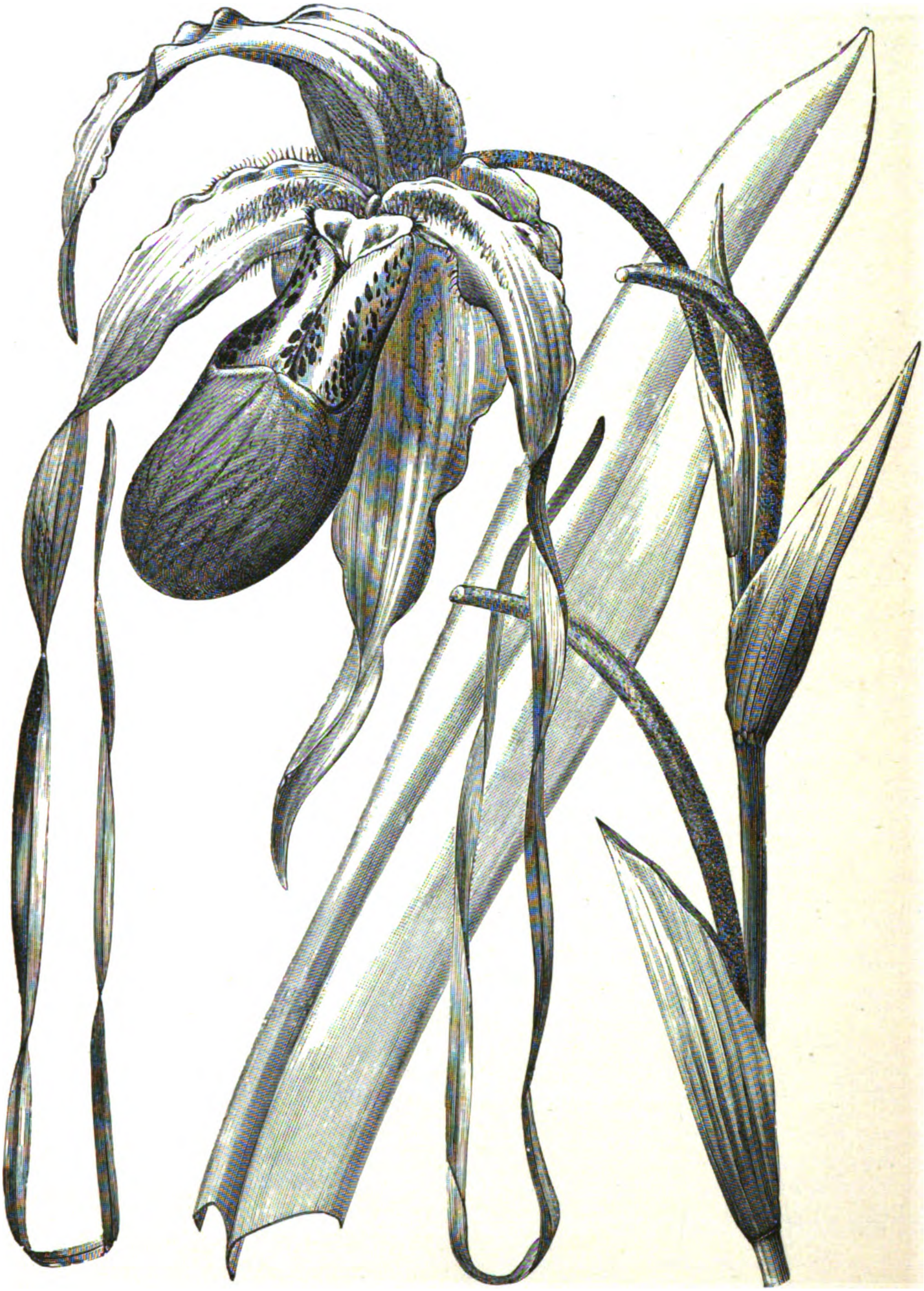
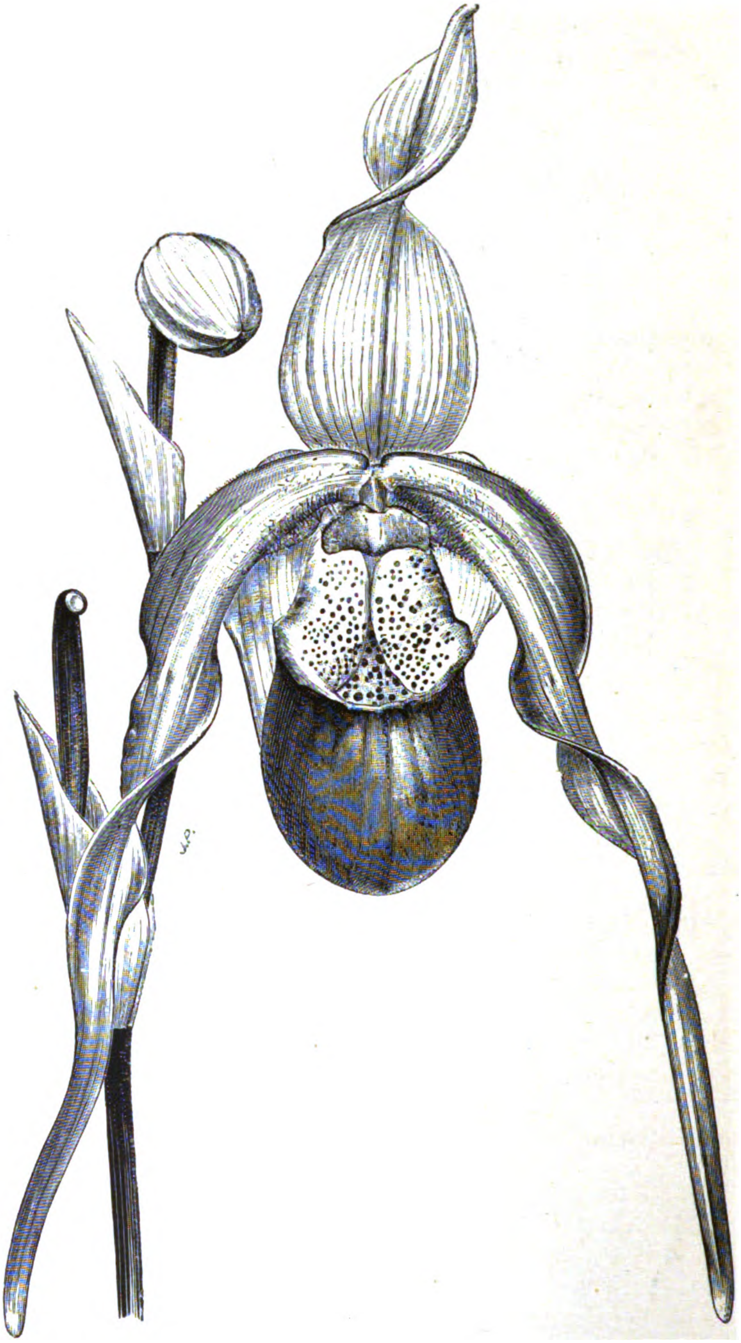
* Not seen by us.



Cypripedium grande.



Cypripedium Schrœderæ.

C. Saundersianum.*

C. caudatum Warscewiczii × *C. Schlimii.*

"Upper sepal whitish with green and purple (rose-pink) veins; lower sepal white, green at the tip; petals ligulate, acuminate, undulate, pale purple (rose-pink); lip (rose-pink, the infolded lobes) spotted with purple? on a white ground. Staminode bearded outside."

Cypripedium Saundersianum, Hort. Marshall. Rchb. in Gard. Chron. XXVI. (1886), p. 654.

Raised by Mr. Marshall, of Enfield, and dedicated by him to the late Mr. W. Wilson Saunders, the Mæcenas of horticulture of his time, and for many years Treasurer of the Royal Horticultural Society.

C. *Schroederæ.

C. caudatum × *C. Sedenii.*

Flowers large, 3—5 or more on each scape; upper sepal 3 inches long, whitish suffused with pale rose-pink and veined with green; lower sepal white with less of the rose tint; petals pendulous, twisted, 4—5 inches long, pale rose-pink with darker veins, except the broader basilar portion which is whitish; lip bright rose-pink, the infolded lobes ivory-white spotted with rose-purple. Staminode whitish, fringed with purple hairs at the back.

Cypripedium Schroederæ, Rchb. in Gard. Chron. XIX. (1883), p. 432. Williams' *Orch. Alb. V.* t. 196.

Raised by Seden at our nursery. It is one of the finest hybrids yet raised among the SELENIPEDIA; its stately racemes of large delicately coloured flowers afford a striking instance of the rapid progress made in the hybridisation of orchids during the past few years. This fine acquisition is appropriately dedicated to the Baroness Schroeder, of the Dell, near Staines.

C. Sedenii.

C. Schlimii × *C. longifolium* and *vice versâ.*

Upper sepal ivory-white with a faint flush of pale rose, rose-pink at the back; lower sepal similar; petals twisted, white tinted with pale rose towards the margins and apex; lip rose-pink, the infolded lobes ivory-white spotted with rose. Staminode white with a few pink spots and a fringe of purple hairs on each side.

Cypripedium Sedenii, Rchb. in Gard. Chron. 1873. p. 1431. Jennings' *Orch.* t. 4. *Fl. Mag.* n. s. t. 208. *Id.* t. 302. De Puydt, *Les Orch.* t. 13.

var.—albanense.

C. Schlimii × *C. Sedenii?*

Differs in no essential character from the original *Cypripedium Sedenii*, except that the lip has more of the contracted aperture and infolded lobes of *C. Schlimii.*

C. Sedenii albanense, supra. C. albanense, Hort.

---

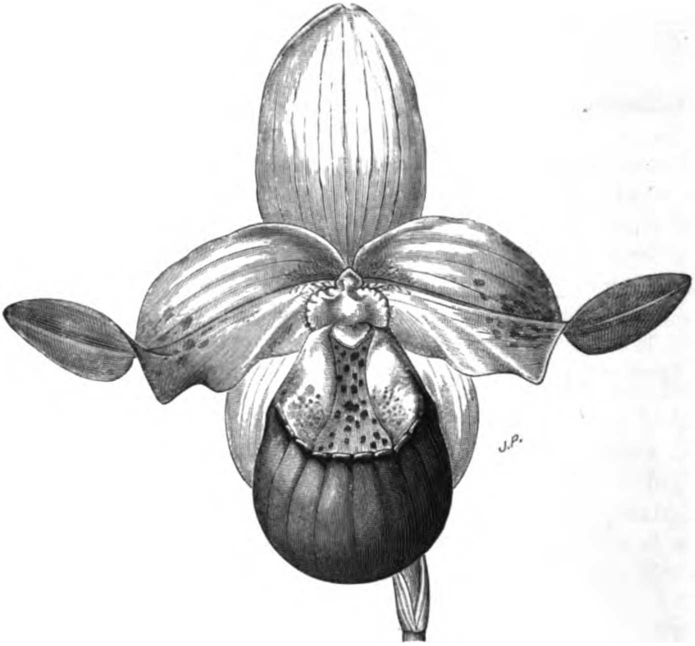
* Not seen by us. The parentage was communicated to us by the raiser many years ago.

var.—candidulum.

C. longifolium × *C. Schlimii albiflorum.*

Sepals and petals ivory-white, the former with pale yellow-green veins, the latter with a faint flush of pale rose towards the tip; lip pale rose, the infolded lobes ivory-white spotted with dark rose.

C. Sedenii candidulum, Rchb. in Gard. Chron. XXII. (1884), p. 489.



Cypripedium Sedenii.

var.—porphyreum.

C. longifolium Hartwegii (*Roezlii*) × *C. Schlimii.*

Plant more robust with longer leaves than the typical *Cypripedium Sedenii.* Flowers somewhat larger and deeper coloured, but not otherwise distinguishable from the type.

C. Sedenii porphyreum, supra. C. porphyreum, Rchb. in Gard. Chron. IX. (1878), p. 366.

The typical *Cypripedium Sedenii* and the varieties *candidulum* and *porphyreum* were raised by Seden at our nursery; of the origin of the variety *albanense* we find no trace beyond what is indicated by the name. The merits of *C. Sedenii* as a horticultural plant are too well known to require special notice here (*see* page 69); its variety *candidulum* is one of the most admired of light-coloured Cypripedes.

C. stenophyllum.

C. Schlimii × *C. caricinum.*

Upper sepal pale rose, with whitish central area and green veins; lower sepal whitish with pale green veins; petals whitish at the base, the remainder pale rose-pink, darker at the apex; lip rose-pink, the infolded lobes ivory-white dotted with dark rose-pink. Staminode whitish, fringed behind.

Cypripedium stenophyllum, Rchb. in Gard. Chron. V. (1876), p. 461.

Raised by Mr. J. C. Bowring, of Forest Farm, near Windsor.

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The names in italics are varieties or synonyms ; those followed by* × *are hybrids.

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This work received the award of a Diploma at the International Forestry Exhibition at Edinburgh, 1884, and a *Medaille de Vermeil* at the Quinquennial International Exhibition at Ghent in April, 1888.

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